<table>
<tr><th>Comment # and Topic</th><th>Comment</th><th>Response</th></tr>
<tr><td>1 – Delineation</td><td>Please provide a map showing all of the sample points taken for the wetlands delineation, including the paired sample points taken on either side of the delineated boundaries. Please include an explanation of the surface features used to draw the boundaries and any other technical work that was performed for this delineation.</td><td>Please see the enclosed Updated Jurisdictional Delineation Report for all observation locations within the coastal zone.

The limits of the jurisdictional areas depicted in the enclosed Updated Jurisdictional Delineation Report are based upon the vegetation boundaries visible on aerial photography and confirmed in some locations using GPS based on the presence of hydrophytic plant communities. Soil pit data was not collected at this time as a result of restrictions on sampling on the Marine Corps property.</td></tr>
<tr><td>2a – Delineation</td><td>Please clarify the amount of impacts. Data presented in the Jurisdictional Determination and Wetlands Delineation Technical Assessment (JD) contradicts data presented in the Consistency Certification (CC), Focused Summary (FS), and Addendum to JD. Please explain how and why these acreages changed and verify the correct amount of impacts.

JD:
Permanent (ac) Temporary (ac) Total (ac)
0.34 8.22 8.56 (appears in table)
8.71 (appears in text)

CC, FS, and Addendum to JD:
Permanent (ac) Temporary (ac) Total (ac)
0.46 6.44 (text) 6.90
6.64 (table) 7.10</td><td>The April 6, 2005 delineation incorrectly totaled impacts to CCC jurisdictional features. As indicated by asterisks in Table 4.6.1-1 of the April 6, 2005 delineation, FE/7-San Mateo Creek, FE/7-San Mateo Marsh – East of I5, FE/7 – San Onofre Creek, FE.7-VM20 and FE/7-VP3 are all subject to CCC jurisdiction. Therefore, permanent impacts to CCC jurisdiction totaled 0.57 acre rather than 0.34 acre. Temporary impacts were correctly totaled as 8.22 acres.

The September 26, 2005 addendum correctly identified 0.46 acre of permanent impact to CCC jurisdiction and 6.44 acres of temporary impact to CCC jurisdiction. The reductions resulted from refinements in the alignments designed to minimize impacts in the coastal zone. Please see Exhibit 1 of the enclosed Updated Jurisdictional Delineation Report.

The Focused Summary incorrectly reported 6.64 acre of temporary impact in the temporary impact table. This is clear if you add the individual impacts reported in the table (5.3 acres + 1.14 acres).

The CCC jurisdictional limits used for the impact analysis in the April 2005 and September 2005 Delineation and Addendum required additional refinement based on improvements in digital base data. The attached CCC delineation report uses the most recent refined jurisdictional limits as well as the most recent refined impact limits and indicates that 0.16 acre of CCC wetlands will be permanently impacted and 7.70 acres of CCC wetland will be temporarily impacted. As part of the process to refine the CCC jurisdictional limits, TCA conducted additional engineering refinements to determine if grading impacts could be reduced. TCA identified three areas where impacts could be reduced and these are reflected in the numbers avoid, which are the correct impact totals. Please see Exhibit 2 of the enclosed Updated Jurisdictional Delineation Report for a depiction of the refinements made in both the grading limits and the jurisdictional limits.</td></tr>
<tr><td>2b – Vegetation</td><td>Please provide a table that shows clearly the amount (in ac) impacted, the habitat type* impacted, the mitigation ratio, and the amount (in ac) of proposed mitigation.

* Please use a standardized vegetation classification system, such as the List of CA Terrestrial Natural Communities Recognized by The California Natural Diversity Database Sept 2003 (from the CA Dept of Fish & Game). If you use a different classification system, please define the categories and terminology used.</td><td>Regarding a table, please refer to Response 2a, 6, and 30 for clarification on impacts to vegetation types, jurisdictional areas, and proposed mitigation.

Regarding a standardized vegetation classification system, a standardized vegetation classification system was used in the biology studies prepared for the Final EIR. The standardized classification system used was the County of Orange Habitat Classification System (“OCHCS”). The OCHCS is the same for many species, and similar for others, to both Holland (1986) and Sawyer Keeler-Wolf (1995) but is specifically tailored for the resources within the study area in south Orange County and northern San Diego County. The equivalent special status vegetation types between the OCHCS, Holland, and Sawyer and Keeler-Wolf, are provided in the Natural Environment Study. Please see Attachment 1: Table 5.3-4 of the Natural Environment Study.

The Natural Environment Study is part of the Final EIR technical studies. As you will see in Attachment 1, the OCHCS includes 12 categories of coastal sage scrub communities, compared to one in the CNDDB/Holland system. We have also attached for your use explanations and descriptions of the OCHCS categories, in Attachment 2: Natural Environment Study Section 5.0.

The U.S. Fish and Wildlife Service (“Service”) concurred that the OCHCS provided the appropriate level of specificity for describing the resources. The OCHCS was also used for the Southern Subregion Natural Communities Conservation Plan (NCCP), a habitat conservation planning program approved by the Service and the California Department of Fish and Game that covers over half of the project study area.</td></tr>
</table>

Comment # and Topic	Comment	Response
		As further background, and to explain why the California Natural Diversity Data Base ("CNDDB") was not the primary source for the classification system, the CNDDB is a database for special status species and special status vegetation types. It should not be utilized to classify all vegetation types because it only focuses on those types that are limited in distribution. Our classification needed to include all vegetation types present within our study area, regardless of the sensitivity status. Holland (1986) and CNPS also provide designations of sensitive vegetation types; however, again we were required to document all communities, not only those listed by the CNPS or Holland as sensitive. CNPS and Holland have a general vegetation types classification system statewide; however, these resources are not as detailed for the project area in south Orange County and northern San Diego County. This comment is repeated in several other places. We have not cross-referenced all responses, but note that this information addresses the vegetation classification system and thus addresses this comment wherever it is repeated. Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: CDFG, Non-game Heritage Program. Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: CNPS.
3 - Delineation	**Please provide a map** that shows the locations of the features listed in Tables 1-4 of the *Addendum to JD*. Please include the boundaries of the Preferred Alternative and the coastal zone.	See the enclosed *Habitat Mitigation and Monitoring Plan* (Appendix B).
4 - Delineation	**Please prepare an Exhibit,** such as Exhibit 1 or 2 in the Addendum to JD, for CCC jurisdiction.	Please see the enclosed *Updated Jurisdictional Delineation Report*.
5 – Temporary Impacts	**Please define temporary impacts.** Indicate the cause of the temporary impact, the length of time it will occur, if the vegetation will be removed or result in its death, and if restoration will be necessary.	Please see *Attachment 3: Table of Temporary Impacts in the Coastal Zone* for a summary of construction activities anticipated to result in temporary impacts in the coastal zone. Temporary impacts occurring within the coastal zone during construction are defined based on the type of habitat impacted. For riparian communities, such as Coastal Commission jurisdictional wetlands, impacts will be considered temporary if the area in which the habitat is located is affected for a period of 12 months or less. For upland communities, such as coastal sage scrub, temporary impacts will be defined as those impacts that occur during the duration of construction activities. Vegetation in the temporary impact areas will be removed only where necessary. After construction activities are completed, habitat restoration will be performed to a level where the vegetation in the area will be at or better than the pre-construction condition.
6 –Vegetation	**Please augment** *Figure 4* (*Consistency Certification,* p.46) to include: - Vegetation types* - All permanent and temporary impacts (*Fig 4* does not show permanent impacts to San Mateo Creek, San Mateo Marsh, or San Onofre Creek) - The location of San Mateo Marsh (it is described on p.43 as located immediately east of I-5 and north of Basilone Rd., but several other maps show San Mateo Marsh as also located west and south of I-5.) * Please use a standardized vegetation classification system.	Please see the enclosed *Updated Jurisdictional Delineation Report*. Regarding the vegetation classifications, please see response to Comment 2b, above.

Comment # and Topic	Comment	Response
7 – San Mateo Creek	**San Mateo Creek**- Please provide a map that shows what type of construction is proposed at San Mateo Creek, a description of these structures, the vegetation mapped* in and around the creek, the wetland delineations, and the permanent and temporary impacts to wetlands. We are attaching for you to use as guidance a map and chart provided by Caltrans for the Devil's Slide tunnel project which shows how, in addition to actual delineation and descriptive information, this information can be compiled, summarized and mapped in a manner making it useful for reviewers. * Please use a standardized vegetation classification system.	Please see *Attachment 4: Proposed Construction at San Mateo Creek* for maps of construction type and location, vegetation, and wetlands impacts. At San Mateo Creek, two new bridge connectors (a northbound and southbound) will be constructed to link SR-241 to I-5. In addition, an access road will be constructed under the south abutment of the existing I-5 San Mateo Creek Bridge to allow military vehicles from Camp Pendleton to pass under I-5. Rock Slope Protection (RSP) drainage outlets are proposed on the north and south side of San Mateo Creek. A Southern California Gas 12-inch high-pressure gas line (presently within San Mateo Creek) will be relocated. *Northbound Connector.* The proposed northbound connector bridge will support two lanes of northbound SR-241 traffic with a 5-foot shoulder to the left, a 10-foot shoulder to the right, and concrete barriers on each edge. The total width of the bridge is 41 feet, 10 inches. The total length of the bridge will be 3,860 feet, with 16 spans. The bridge will be a cast-in-place pre-stressed (CIP/PS) concrete box girder bridge. The bridge will be a 10-foot deep, 16-span structure, with single column bents. The structure will be founded on pile foundations consisting of 12-foot diameter cast-in-steel-shell (CISS) or cast-in-drilled-hole (CIDH) concrete piles at the bents; and 36-inch and 24-inch CIDH piles at the abutments. The 15 columns supporting the bridge will have a diameter of approximately 10 feet above the foundations. Only three of the column supports of the northbound connector will be located in Coastal Commission wetlands. Falsework will be temporarily erected in San Mateo Creek to facilitate construction of the connector. The falsework will consist of temporary bents and steel pipe supports installed to form the bridge soffit and stems. After the concrete has been poured and cured and the bridge pre-stressed, the falsework will be removed from the site, leaving the concrete bridge structure. Due to the potential for liquefaction and lateral spreading during seismic events (earthquakes), ground stabilization improvements are anticipated for the southern most structure foundations from Abutment 1 to Bent 3. The ground improvement will consist of pressure grouting or installation of stone columns to densify the upper 50 feet of soil and reduce the potential for liquefaction and associated subsidence. All project aspects of the northbound connector have been designed to required Caltrans standards. See also response to Comment 21, below. *Southbound Connector.* The proposed southbound connector bridge will support two lanes of southbound SR-241 traffic with a 5-foot inside shoulder to the left, a 10-foot outside shoulder to the right, and concrete barriers on each edge. The total width of the bridge is 41 feet, 10-inches. The total length of the bridge is 3,910 feet, with 15 spans. The bridge will use a cast-in-place pre-stressed (CIP/PS) concrete box girder bridge for the southbound connector separation. The 15-span bridge will be 11 feet deep with 12 single column bents and two outrigger bents with similar columns where the connector crosses the I-5 freeway. The structure will be founded on pile foundations consisting of 12-foot diameter (CISS or CIDH concrete piles at bents and 24-inch diameter CIDH concrete piles at abutments. The columns supporting the bridge will have a diameter of approximately 10 feet. Only one of the column supports for the southbound connector will be located in Coastal Commission wetlands. Falsework will be temporarily erected in San Mateo Creek to facilitate construction of the connector. The falsework will consist of temporary bents and steel pipe supports installed to form the bridge soffit and stems. After the concrete has been poured and cured and the bridge pre-stressed, the falsework will be removed from the site, leaving the concrete bridge structure. Due to the potential for liquefaction and lateral spreading during seismic events (earthquakes), ground stabilization improvements are anticipated for the southern most structure foundations from Abutment 1 to Bent 3. The ground improvement will consist or pressure grouting or installation of stone columns to densify the upper 50 feet of soil and reduce the potential for liquefaction and associated subsidence. All project aspects of the southbound connector have been designed to required Caltrans standards. See also response to Comment 21, below. *Green Beach Access Road.* An access road (Green Beach Access Road) is proposed for Camp Pendleton along the southerly abutment of the San Mateo Creek Bridge. Completion of this access road will require construction of retaining walls to accommodate the road's 50-foot width. The road will extend approximately 400 feet across the Caltrans right-of-way. This new access point will allow military vehicles

Comment # and Topic	Comment	Response
		and equipment from Green Beach to cross under I-5 without impacting sensitive wetlands habitat in San Mateo Creek. *Rock Slope Protection Drainage Outlets.* Rock Slope Protection (RSP) drainage outlets are proposed on the south and north sides of San Mateo Creek. The RSP is placed for erosion control and utilizes rip rap as an energy dissipater for the onsite and offsite flows from the FTC-S. All onsite flow will be treated in a sand filter basin (SFB) prior to discharge at the RSP drainage outlet. *Relocation of Southern California Gas 12-inch High Pressure Gas Line.* A 12-inch high-pressure natural gas line presently exists in San Mateo Creek in the vicinity of the proposed SR 241 connector structures (see *Attachment 4*). At its present location the gas line would result in a longitudinal encroachment within the future SR-241 right-of-way. Such encroachments are not allowed by Caltrans and so the gas line will be relocated to eliminate this conflict. The gas line will be intercepted and rerouted to the east and placed in a trench approximately 5 feet deep. The trench will be excavated with a backhoe and backfilled with sand following pipe installation. The line will join back into the existing gas main beneath the proposed southbound connector bridge.
8 – San Onofre Creek	**San Onofre Creek-** exactly what type of construction is proposed here (p.42)? Is it only widening the bridge supports? What else is involved in the construction of the proposed bridge widening here? Please provide a map that shows what type of construction is proposed at San Onofre Creek, a description of these structures, the vegetation mapped* in and around the creek, the wetland delineations, and the permanent and temporary impacts to wetlands. * Please use a standardized vegetation classification system.	Please see *Attachment 5: Proposed Construction at San Onofre Creek* for maps of construction type and location, vegetation, and wetlands impacts. At San Onofre Creek, the FTC-S project includes widening of the two existing I-5 bridges (northbound and southbound). The existing structures are four-span continuous cast-in-place reinforced concrete box girder structures. These structures are 354 feet long, and the superstructure is 68.0 feet wide and 5.5 feet deep for both bridges. The two I-5 bridges will be widened to accommodate the I-5/SR 241 direct northbound and southbound connectors. The three existing piers of each bridge will be lengthened. The details of this widening are described below: *Original Bridge Structures.* The existing I-5 San Onofre Creek Bridge is made up of two separate cast-in-place reinforced concrete box girder structures, carrying the northbound and southbound I-5 traffic, respectively. The original structures were constructed in 1968 and are supported on seat type abutments and pier walls that are 2 feet thick. The existing foundation system consists of driven steel piles. The existing bridge superstructure and piers will be widened to accommodate the construction of the new connector ramps. *Bridge Widening.* The proposed new construction will include widening the existing bridge superstructure utilizing cast-in-place reinforced concrete box girders to accommodate the geometric requirements for the northbound and southbound connectors to and from SR-241. The proposed widening will match existing grade and cross slopes. Due to the roadway geometry, the widenings on the outside of the San Onofre Creek Bridges are variable widths. The northbound structure will be widened by an additional 38 to 55 feet. The southbound structure will be widened by an additional 41 to 58 feet. The widened portion of the bridge will be supported on 2 feet thick pier walls that match the existing bridge supports. The pier walls will be founded on 36-inch diameter CIDH concrete piles. All or part of four of the pier walls are located in Coastal Commission wetlands. Falsework will be temporarily erected in San Onofre Creek to facilitate construction of the bridge widening. The falsework will consist of temporary bents and steel pipe supports installed to form the bridge soffit and stems. After the concrete has been poured and cured and the bridge pre-stressed, the falsework will be removed from the site, leaving the concrete bridge structure. Scour could potentially be a concern for the existing San Onofre Creek Bridge. If scour is determined to be a problem, the existing bridge foundations would need to be strengthened to minimize collapse potential. If it is determined that scour is not a concern, then the area identified in *Attachment 4* as temporary wetlands impact area could be reduced under the existing I-5 bridge structures.
9 – San Onofre Gate	**San Mateo Marsh and San Onofre Gate**- exactly what type of construction is proposed here (p.43)? There is no detailed description of the national security improvements in Section III.B as is stated. Please provide a map that details the proposed construction for the San Onofre Gate and shows the vegetation mapped* (including wetland	Please see *Attachment 6: Proposed Construction at San Onofre Gate* for maps of construction type and location, vegetation, and wetlands impacts. At the San Onofre Gate, the project includes expansion and reconstruction of the existing gate, and the reconstruction of the existing access road (Toby's Road) from Basilone Road to the military training area (former agricultural area) to align with the new Basilone Road configuration. These improvements will be constructed as requested by Camp Pendleton (at no cost to the U. S. government) to meet

Comment # and Topic	Comment	Response
	delineations) in and around the gate and San Mateo Marsh. * Please use a standardized vegetation classification system.	current homeland security guidelines. The new gate facility will include a new state-of-the-art enhanced security facility, six sentry houses, a 510 square foot gatehouse, dual guard stations, three truck inspection areas with canopy, a watchtower, a visitor processing office, upgraded control gates and perimeter fencing and a parking area. The paved area (including the access road) will be 3.5 acres and will include drainage facilities, lighting (pole-mounted lighting and roadway lighting), signing and utilities. The realigned Toby's Road will pass under the realigned Basilone Road via an arch culvert. Toby's Road will provide access to the military training area to the north of I-5 (former agricultural area) and will also be extended to provide a new access under the southerly abutment of the San Mateo Creek. This road will provide access for Camp Pendleton personnel between one side of I-5 to the other in this area, where no access currently exists. A Caltrans maintenance road will be provided from the Basilone interchange to a sand filter basin (SFB) located south of San Mateo Creek.
10 – Shade Analysis	Please provide a copy of **the shade analysis** (p.43).	Please see *Attachment 7: Shading Study*.
11 – Shade Analysis	**The shade analysis at San Mateo Creek (northbound)**- What is the height of the existing San Mateo Creek bridge (p.43)? What is the proposed height of the new northbound connector? The northbound connector will span 920 ft of the San Mateo Creek. Is this in addition to the area already shaded by the existing bridge? Please provide a detailed vegetation map* (including wetland delineations) that shows the current bridge, proposed connector, and makes the location of the 920 ft of southern riparian scrub clear. Please also define southern riparian scrub or use a standardized vegetation classification system. * Please use a standardized vegetation classification system.	Please see *Attachment 7: Shading Study*.
12 – Shade Analysis	**The shade analysis at San Mateo Creek (southbound)**- What is the proposed height of the new southbound connector (p.43)? How many feet will the southbound connector span of the San Mateo Creek? Is this in addition to the area already shaded by the existing bridge? Is the 0.29 ac the only additional shading? Please provide a detailed vegetation map* (including wetland delineations) that shows the current bridge, proposed connector, the small segment that will ride over the existing bridge, and makes the location of currently shaded habitat (and its vegetation types*) and any proposed newly shaded habitat (and its vegetation types*) clear. Please also define any vegetation types used to describe this area. * Please use a standardized vegetation classification system.	Please see *Attachment 7: Shading Study*.

Comment # and Topic	Comment	Response
13 – Shade Analysis	**The shade analysis at San Onofre Creek (widening)**- What is the height of the existing San Onofre Creek bridge (p.43)? What is the proposed height of the newly widened bridge? How many feet will the newly widened bridge shade? Is this in addition to the area already shaded by the existing bridge? Please provide a detailed vegetation map* (including wetland delineations) that shows the current bridge, proposed widening, and makes the location of currently shaded habitat and any proposed newly shaded habitat clear. Please also define any vegetation types used to describe this area. *Please use a standardized vegetation classification system.	Please see *Attachment 7: Shading Study*.
14 – Defining Impacts	**Please clarify** what is meant by, "The analysis which quantified the impact acreage assumed that all features within the disturbance limits are permanently filled, except for those that will be bridged (p. 44)." What is meant by "features"? What is meant by "those that will be bridged"?	Impacts to San Mateo and San Onofre Creek wetlands were quantified the following way: Wetlands or any other ESHA features (such as CSS) which are present within the project's disturbance limit were considered to be permanently impacted EXCEPT within San Mateo and San Onofre Creeks. Because the project bridges these creeks, wetlands features that occur within the disturbance limit (or more accurately, below the bridge) are considered to be temporarily impacted except where the bridge columns touch down. Please see *Attachment 4: Proposed Construction at San Mateo Creek* and *Attachment 5: Proposed Construction at San Onofre Creek* for the location of temporary and permanent wetlands impacts at each creek. In the sentence on page 44 of the Consistency Analysis, the word "*features"* includes wetlands or any other ESHA feature, such as CSS. *"Those that will be bridged"* refers to those features that will not be filled, but which will be below the bridge and only temporarily impacted during construction.
15 – Defining Impacts	**Please clarify** what is meant by, "…while the remaining bridge right of way was assumed to be temporarily impacted for piling installation, although the bridge structure will span over the open terrain (p. 44)." What is meant by "bridge right of way"? What is meant by "piling installation" (there is no previous mention of this)? What is meant by "open terrain"? Please use a standardized vegetation classification system when referring to habitat types.	As stated in the response to Comment 14, above, temporary wetlands impacts to San Onofre and San Mateo Creeks are designated as such because these areas will not be filled; they will be spanned by bridges. The only impacts to wetlands below the bridge span that are considered permanent impacts are the areas where the bridge columns (or piles) are located. Please see *Attachment 4: Proposed Construction at San Mateo Creek* and *Attachment 5: Proposed Construction at San Onofre Creek* for the location of temporary and permanent wetlands impacts at each creek. See also *Attachment 3: Table of Temporary Impacts in the Coastal Zone.* In the sentence on page 44 of the Consistency Analysis, *"bridge right-of-way"* refers to the right of way of the bridges that span San Mateo and San Onofre Creeks. *"Piling installation"* refers to the area below the bridges where the bridge columns (or piles) touch the ground. *"Open terrain"* refers to the area below the bridge that will remain open, or that area which will not be affected by the bridge columns, and thus is only temporarily impacted.
16 – Vegetation	**Please augment Table 4** (p. 44) to include Vegetation Type. Please use a standardized vegetation classification system, such as the *List of CA Terrestrial Natural Communities Recognized by The California Natural Diversity Database* Sept 2003 (from the CA Dept of Fish & Game). If you use a different classification system, please define the categories and terminology used.	Please see response to Comment 2b.
17 – Vegetation	**Please augment Table 5** (p.45) to use a standardized vegetation classification system, as mentioned above.	Please see response to Comment 2b.
18 – Traffic	**Please reconcile how** the FTC-S will maintain current	The "Purpose and Need" adopted by The Collaborative focused on alleviating future traffic congestion and accommodating the need for

Comment # and Topic	Comment	Response
	levels of capacity **and** alleviate existing and future traffic (p.47)? This statement appears to contradict a subsequent statement that FTC-S will , "…serve existing and developing employment centers and major attractions (p.50)." A detailed explanation is needed.	mobility, access, goods movement and future traffic demands on I-5 and the arterial network. However, because there are substantial existing deficiencies on I-5 and arterials in the study area, FTC-S will help to prevent existing congestion from worsening over time, thus maintaining existing traffic capacity. The reference to maintaining existing traffic capacity on page 47 of the Consistency Analysis reflects the fact that, if no additional capacity is provided, the level of service on the I-5 and adjacent arterials will continue to worsen. In other words, existing traffic capacity cannot be maintained in the future (without additional capacity) because approved and forecast growth (consistent with adopted forecasts) will result in increased trips on the system. The FTC-S will help to maintain existing traffic capacity by reducing the congested percentage of daily traffic. The percent of daily vehicle miles traveled (VMT) on I-5 that is forecast to occur under congested conditions is 3.2% with FTC-S, compared to 22.7% if FTC-S is not built. (Please see Table 3.4-8 in the Final EIR, Scenario 3). Thus, while FTC-S does not completely eliminate congestion, it dramatically reduces it compared to not building FTC-S. Arterial system delay will also be dramatically reduced with FTC-S. Total hours of delay during the AM and PM peak at signalized arterial intersections in the study area will be 13,200 if FTC-S is not built, and 7,700 with FTC-S, a reduction of 5,500 hours of delay. (see Table 3.4-9 in the Final EIR). The statement on page 47 does not contradict the statement on page 50 because FTC-S will provide benefits for both current conditions and projected future conditions, as described above. For further details, please see Section 3.0 of the Final EIR, in particular pages 3-22 to 3-30 and the SOCTIIP Traffic and Circulation Technical Report.
19 – Shade Analysis	**Is the southbound connector** to the 5 over San Mateo Creek 3,910 ft long? Is the northbound connector 3,860 ft long (p. 48)? How does this reconcile with the 920 ft of shade stated in the impacts section (p.43)?	Please see *Attachment 7: Shading Study.* The southbound connector to the I-5 over San Mateo Creek is 3,910 feet long and the northbound connector is 3,860 feet long. These connectors remain on bridge structure for a long distance beyond the limits of San Mateo Creek and as such the shade analysis was limited to that portion of the bridge spanning the ordinary high water mark of the creek (i.e. 920 feet).
20 – Defining Impacts	**Are there** 29 support columns and 4 abutments in total or only in the coastal zone? If only in the coastal zone, how many are there total (p.48)? This equates to 2,320 ft ^{2} or 0.05 ac of impacts. Why isn't this 0.05 ac of impacts included in the impacts Tables 4 or 5? Please clarify this.	There are 29 support columns and 4 abutments in total and all are within the coastal zone. As stated in the response to Comment 19, above, the southbound and northbound connectors remain on bridge structure for a long distance beyond San Mateo Creek. Only 4 of the 29 columns land within San Mateo Creek, thus the impact to Coastal Commission wetlands is only 0.006 acres, which has been rounded up to 0.01 acres. This impact area has been included in Table 4 of the Consistency Analysis under the heading of San Mateo Creek.
21 – Structure Design	What specifically within the Caltrans standards makes 0.01 ac of impacts unavoidable (p. 48)?	The 0.01 acres (actual acreage is 0.006 which has been rounded up to 0.01 acres) of impact are a result of the new pier walls that are required for the widening of the existing San Onofre Creek bridge structure. The bridge requires widening because the Caltrans Highway Design Manual (HDM) defines the parameters for the design of the ramps connecting Basilone Road to I-5. Similarly, the HDM defines the separation distance between ramps and adjacent branch connectors on an interstate highway. Every effort has been made to minimize the length of the ramps and branch connectors (i.e. connect the ramps to I-5 before San Onofre Creek). However, the location of Basilone Road constrains the design of the connectors and requires their extension southward beyond San Onofre Creek, thus requiring widening of the existing I-5 bridge at San Onofre Creek. References: The design parameters for the ramps are found in Caltrans HDM Chapter 500: http://www.caltrans.ca.gov/hq/oppd/hdm/pdf/english/chp0500.pdf

Comment # and Topic	Comment	Response
		HDM Topic 504.3(9), *Distance Between Successive On-ramps*, states that the minimum distance between two successive on-ramps to a freeway lane should be the distance needed to provide the standard on-ramp acceleration taper shown on Figure 504.2A. This distance should be about 1000 feet… HDM Topic 504.3(10), *Distance Between Successive Exits*, states that "the minimum distance between successive exit ramps for guide signing should be 1000 feet on the freeway…" Please note that in addition to the required separation between successive ramps, there is also a requirement for an auxiliary lane for a branch connection. HDM Topic 504.4(6), *Branch Connection*, states that "at a branch merge, a 2500-foot length of auxiliary lane should be provided beyond the merge of one lane of the inlet…" Even if the ramp connections to I-5 could be moved northerly, the auxiliary lane would still dictate the need to widen the San Onofre Creek Bridge.
22 – Structure Design	In response to our request for information about "wetland avoidance" alternatives for the San Mateo Creek crossing near I-5, TCA submitted a document entitled "*Alternative Designs for Connectors to I-5,*" dated April 2006 was reviewed. This document is poorly written, confusing, and contains conclusions without substantiations. It is impossible to determine the costs of the various alternatives, the feasibility, or the environmental effects of any of the alternatives included. It includes an attachment "Perspective Rendering for other Feasible Structure Types" implying that such renderings might be feasible, but without any accompanying analysis of feasibility factors. Please include information necessary to make comparisons such as cost, technical feasibility, extent of visual, habitat, or other effects, amount and location of grading needed where grading is cited as a relevant feasibility factor, and any relevant Marine Corps requirements that may bear on feasibility.	We have prepared a revised report that clarifies the information and addresses the comment. See *Attachment 8: Comparison of Bridge Construction Types.*
23 – Impact Avoidance	**Please clarify** this sentence, "Second, known wetland areas that required a crossing of a major watercourse were identified and avoided by placing the alignment of bridge structure, such as the crossings of San Juan Creek, San Mateo Creek, and Canada Gobernadora (p. 49)." What was avoided and how was this done? What about San Onofre Creek? What specifically were the site-specific refinements made to avoid wetlands and encroachment into drainages? Please provide a copy of the maps that were plotted with environmental issues and land use data to minimize impacts.	The majority of the sensitive habitat in the San Juan, San Mateo and Canada Gobernadora creek areas was avoided by placing the crossing on bridge structures. An alternative would have been to place the road on an embankment fill at these major crossings which would have resulted in large impacts to sensitive habitat. Specifically, bridges are proposed at these large crossings to avoid the large impact footprint of an embankment fill. The same concept was applied at San Onofre Creek where the proposed widening of I-5 is accomplished on bridge structure and not by placing embankment fill in the creek. The maps reviewed for this effort are the vegetation and sensitive resources maps and the ladn use maps in the Final EIR. No additional maps were prepared that plot the environmental and land use issues related to crossing the large drainages on embankment fills. This concept was never advanced, as it was determined early in the design process that the most environmentally sensitive approach to crossing these drainages would be on bridge structures.
24 – I-5 Widening	**Please provide** a map that shows what type of construction is proposed at San Mateo Creek for the I-5 Widening Alternative, the vegetation mapped* in and around the creek, the wetland delineations, and the permanent and temporary impacts to wetlands. Please explain why these impacts would be significant and permanent, while the FTC-	Please see *Attachment 9: I-5 Widening Alternative at San Mateo Creek* for maps depicting the location of temporary and permanent wetlands impacts, and vegetation types, at San Mateo Creek associated with the I-5 Widening Alternative. To clarify, impacts to wetland resources at San Mateo Creek for the I-5 widening would be similar to those of FTC-S, as both would require permanent wetland impacts. As shown in *Attachment 9*, a total of 8 pier wall extensions would occur completely within the delineated wetlands and one additional pier wall extension would occur partially within the delineated wetlands.

Comment # and Topic	Comment	Response
	S would not have significant adverse impacts (p. 50-51). *Please use a standardized vegetation classification system.	As stated on page 51 of the Consistency Analysis, in addition to wetlands impacts at San Mateo Creek, construction of the I-5 widening alternative consistent with Caltrans standards would result in the displacement of 838 existing homes and 382 existing businesses, including those in coastal communities, such as San Clemente. For more information on the I-5 widening alternative, please refer to the report entitled *Alternatives Analysis Summary for Foothill Transportation Corridor – South (FTC-S)* submitted to Coastal Staff on February 28, 2007. Appendix A of the *Alternatives Analysis Summary* includes a detailed description of the I-5 widening alternative development methodology as well as a series of figures depicting the alternative's impacts to homes and businesses.
25 – Defining Impacts	**Mitigation WW-2-** If the final design has not yet been completed, how can total impacts be tallied in Tables 4 and 5?	Design has been completed to a point sufficient to allow environmental analysis of the alternatives, based on a maximum disturbance limit which includes the grading limits, remedial grading limits, right-of-way limits, utility relocation, and construction staging areas for FTC-S. Impacts have been calculated based on the disturbance limits, including the impacts tallied in Tables 4 and 5 of the Consistency Analysis. During final design, the engineers will use the disturbance limit as a limit line that they must stay within. This will ensure that the impact totals already identified will not be exceeded. At the same time, as is often the case with final design, the engineers will be directed to utilize all prudent and feasible methods to reduce the amount of ground disturbance and to reduce impacts on sensitive resources, for example by utilizing additional retaining walls, and thus to reduce project impacts to less than those identified with the current disturbance limits. Mitigation Measure WW-2 references this final design effort.
26 – Mitigation	**Mitigation WW-**3- Is the draft and/or final Biological Resources Management Plan (BRMP) completed yet? What is its status and the status of any review by other agencies.	The BRMP has not yet been prepared, therefore agency(s) reviews have not commenced. The BRMP will be developed in consultation with the agencies prior to construction, during the Final Design phase and after agency(s) permits have been issued. Conditions and requirements of the final permits will be incorporated into the BRMP.
27 – Mitigation	**Mitigation WW-**3(a)- Please include the identification of Environmentally Sensitive Habitat Areas (ESHAs) along with the identification of ESAs, and include the CCC as one of the agencies listed as determinants of ESAs.	The following language will be added to the end of mitigation measure WW-3 (a): "and identification of Environmentally Sensitive Habitat Areas (ESHAs) subject to the jurisdiction of the CCC."
28 – Mitigation	**Mitigation WW-**3 (d)- Duration of restoration efforts and monitoring should be included.	Restoration specifications will be addressed in the BRMP (as required by Mitigation Measure WW-3) and will include implementation, maintenance and monitoring procedures, and schedules for the offsite mitigation/restoration sites, as well as the corridor slope revegetation. Please see *Attachment 10: Table 13 of the Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan* (or the enclosed *Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan*) *for* a summary of the timing and activities for the restoration, maintenance and monitoring of the Upper Chiquita mitigation site. The *Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan* will be included in the HMMP and appended to the BRMP. Based on the proposed restoration model, there will be approximately two years when each restoration area is under very active restoration; followed by approximately three years of establishment activities. Post-establishment, long-term management and performance monitoring will continue through Year 5 of each restoration area documenting the progress toward the ultimate performance standards of the project. Implementation of remedial measures if performance standards are not met, maintenance, and monitoring will extend beyond Year 5 for each restoration area, as necessary, and as shown in *Attachment 10*.
29 – Mitigation	**Mitigation WW-**3 (e)- Is the SWPPP available for review yet? When is it expected to be completed? Has a draft been submitted to the RWQCB?	The SWPPP will be prepared prior to construction during the Final Design Phase, as a condition of the issued Section 401 Certification and per the requirements of the NPDES Construction Activities Storm Water General Permit Order No. 99-08-DWQ. The Draft SWPPP will be submitted to the RWQCB for review prior to construction. As required, the SWPPP will be on-site prior to the start of construction and for the duration of the project where it will be available for review and comment on SWPPP adequacy during compliance and

Comment # and Topic	Comment	Response
		enforcement inspections and proceedings.
30 – Mitigation	**HMMP-** Please provide a map showing where the 15.9 ac of created wetlands will be within the NCCP and the San Juan Creek watershed (p. 55). Please include the boundaries of the NCCP, the coastal zone boundary, current vegetation types*, and projected vegetation types* of the created wetlands. Please also provide Coastal Act delineations for the existing wetlands at the mitigation site, to enable us to assure that proposed mitigation does not constitute "double counting." *Please use a standardized vegetation classification system.	Please see the enclosed *Habitat Mitigation and Monitoring Plan.* Following an intensive search for mitigation opportunities within TCA's right-of-way in the San Mateo Creek watershed, a 1-acre site (referred to in the HMMP as Mitigation Area D) was located and was determined to meet all four screening criteria for mitigation. These criteria included: 1) the site(s) must occur within the two major watersheds being impacted, e.g., San Juan Creek and San Mateo Creek watersheds; 2) the site(s) should consist of largely contiguous areas rather than small pockets of habitat in order to maximize the quality and success of mitigation; 3) the site(s) must be available for mitigation, e.g., the site(s) either must be under management by the TCA currently or be eligible for use if not under ownership/management by the TCA; and 4) the site(s) must exhibit appropriate topography and hydrology to support the proposed habitat types. Mitigation Area D is an upland site that is part of an inactive agricultural field. The 1-acre site falls entirely within TCA's right-of-way and will be located immediately adjacent to an extended detention basin east of the I-5 and south of San Mateo Creek. Creation of southern willow woodland at this site will provide additional CCC wetland habitat that is contiguous with San Mateo Marsh and San Mateo Creek, and will fully offset impacts to 0.16 acre of CCC wetlands. Mitigation Area D is located within the coastal zone and is currently delineated as upland. Because it is presently upland, there will be no 'double counting' when this area is used for mitigation for wetlands. Since Mitigation Area D is in the coastal zone and provides enough area to fully offset impacts to 0.16 acres of coastal wetland, this area should be the focus of mitigation for impacts to Coastal wetlands. Note: Because Mitigation Area D occurs completely within the project right-of-way, it does not require any new dedication of Camp Pendleton property for habitat mitigation. See response to Comment 37, below.
31 – Mitigation	**Mitigation Area A-** Please clarify the proposed mitigation by providing a map with the exact location and size of Mitigation Area A, including all vegetation types,* and the total mitigated acreage. How were these acreages determined? What is the mitigation ratio being proposed for each vegetation type*? *Please use a standardized vegetation classification system.	Please see response to Comment 30.
32 – Mitigation	**Please provide** a copy of the amendment to the Upper Chiquita Canyon Bank Agreement.	Please see the enclosed *Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan.*
33 – Mitigation	**Mitigation Area B-** Please clarify the proposed mitigation by providing a map with the exact location and size of Mitigation Area B, including all vegetation types,* and the total mitigated acreage. How were these acreages determined? What is the mitigation ratio being proposed for each vegetation type*? *Please use a standardized vegetation classification system.	Please see response to Comment 30.
34 – Impact Location	**Please clarify** where within Camp Pendleton these temporary wetlands impacts occur (p. 57). This could be	All wetlands impact areas within the coastal zone occur within Camp Pendleton. These areas are identified in the original Figure 4 of the Consistency Analysis. These temporarily impacted wetlands are present in both San Mateo and San Onofre Creeks, and were quantified

Comment # and Topic	Comment	Response
	included in the augmented *Figure 4* requested in # 2.	as described in the response to Comments 14 and 15, above. Additionally, see *Attachment 4: Proposed Construction at San Mateo Creek, Attachment 5: Proposed Construction at San Onofre Creek,* and *Attachment 6: Proposed Construction at San Onofre Gate,* for the location of temporary and permanent wetlands impacts within the coastal zone.
35 – Mitigation	Does the following list (taken from p. 55-57) represent the **total amount of mitigation** proposed? Please make clear the proposed mitigation ratios for impacts to wetlands and to other vegetation types impacted. This information could be included in the suggested table in #2. 15.9 ac native grasslands, wet meadow, mulefat scrub, southern willow woodland, southern coast live oak/elderberry woodland 20.80 ac 4.66 ac southern willow woodland 4.90 ac coastal sage scrub/native perennial grass 3.06 ac mulefat scrub 7.31 ac wet meadow 0.88 ac oak/elderberry woodland 195 ac 13 ac riparian oak woodland 182 ac native grassland	Please see Tables 6 and 7 in the enclosed *Habitat Mitigation and Monitoring Plan* (Appendix B).
36 – Reference	What and where is the document referenced as **NES, P&D, 2002** (p.42)? We have an "NES" dated December 2003 – is that the intended reference?	The NES is the Natural Environmental Study, which is part of the Final EIR technical studies. Yes, the NES you have is the intended reference.
37 – Camp Pendleton	Since the letter cited on p. 54 from the Marine Corps is over 10 years old, please provide a current statement from the Marine Corps that it would not allow Camp Pendleton to be used for habitat mitigation. Please also provide an explanation from the Marine Corps as to why it would allow water quality mitigation (i.e., the proposed detention basins on I-5) on Camp Pendleton, but not habitat mitigation.	The letter cited on page 54 of the Consistency Certification is indicative of the long-term stance of the Marines that FTC-S must not become an intrusion on Camp Pendleton's operational flexibility and that TCA will satisfy any environmental mitigation requirements resulting from impacts at no expense to the Marines and with no new dedication of Camp Pendleton property. The water quality basins treating water runoff from the highway are Project Design Features and are included within the roadway right-of-way. This right-of-way has been minimized to the greatest extent feasible to reduce both environmental impacts and impacts to the operational efficiency of Camp Pendleton. Like the water quality basin design features, wetlands Mitigation Area D (described in the response to Comment 30, above) is located

Comment # and Topic	Comment	Response
		entirely within the project right-of-way, and therefore does not require any new dedication of Camp Pendleton property for habitat mitigation.

Attachments

Attachment 1: Table 5.3-4 of the Natural Environment Study

Attachment 2: Natural Environment Study Section 5.0

Attachment 3: Table of Temporary Impacts in the Coastal Zone

Attachment 4: Proposed Construction at San Mateo Creek

Attachment 5: Proposed Construction at San Onofre Creek

Attachment 6: Proposed Construction at San Onofre Gate

Attachment 7: Shading Study

Attachment 8: Comparison of Bridge Structure Types

Attachment 9: I-5 Widening Alternative at San Mateo Creek

Attachment 10: Table 13 of the Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan

Enclosures

Updated Jurisdiction Delineation Report

Habitat Mitigation and Monitoring Plan

Draft Upper Chiquita Canyon Conservation Area Comprehensive Habitat Restoration Plan

ATTACHMENT 1
TABLE 5.3-4 OF THE NATURAL ENVIRONMENT STUDY

TABLE 5.3-4
SENSITIVE PLANT COMMUNITIES IN THE SOCTIIP SURVEY AREA

OCHCS Designation (Gray and Bramlet 1992)	CNDDB/Holland Designation (Holland 1986)	CNPS Designation (Sawyer and Keeler-Wolf 1995)
Southern coastal bluff scrub	Southern coastal bluff scrub (G1, S1.1)	---
Venturan-Diegan Transitional CSS California sagebrush-California buckwheat scrub California sagebrush-orangebush monkeyflower scrub Black sage scrub White sage scrub Sagebrush scrub Buckwheat scrub Sagebrush-black sage scrub Coyote brush scrub Mixed sage scrub Sagebrush-coyote brush scrub	Diegan CSS (G3, S3.1)	Coastal scrubs California buckwheat series California sagebrush series California sagebrush-California buckwheat series White sage series Coyote brush series Mixed sage series
Floodplain sage scrub	Riversidean alluvial fan sage scrub (G1, S1.1)	Scalebroom series
Sage scrub – grassland ecotone/sere	--	--
Coastal sage – chaparral scrub ecotone/sere	--	--
Leymus grassland	Valley wild rye grassland (G2, S2.1)	Creeping ryegrass series
Southern coastal needlegrass grassland	Valley needlegrass grassland (G1, S3.1)	Purple needlegrass grassland
Southern hardpan vernal pools	Southern vernal pool (G1, S1.1)	Vernal pools
Southern coastal salt marsh	Southern coastal salt marsh (G2, S2.1)	Pickleweed series
Alkali meadow	Alkali meadow (G3, S2.1)	Sedge series or saltgrass series
Alkali seep	Alkali seep (G3, S2.1)	Sedge series
Cismontane alkali marsh	Cismontane alkali marsh (G1, S1.1)	Bulrush-cattail series
Coastal freshwater marsh	Coastal freshwater marsh (G3, S2.1)	Bulrush-cattail series
Freshwater swale	--	--
Southern vernal marsh	Vernal marsh (G2, S2.1)	Spikerush series
Riparian herb	--	--
Mule fat scrub	Mule fat scrub (G4, S4)	Mule fat series
Southern willow scrub	Southern willow scrub (G3, S2.1)	Arroyo willow series or narrow-leaf willow series
Southern sycamore riparian woodland	Southern sycamore alder riparian woodland (G4, S4)	California sycamore series
Southern coast live oak riparian forest	Southern coast live oak riparian forest (G4, S4)	Coast live oak series
Southern arroyo willow riparian forest	Southern arroyo willow riparian forest (G2, S2.1)	Arroyo willow series
Southern black willow forest	---	Black willow series

TABLE 5.3-4
SENSITIVE PLANT COMMUNITIES IN THE SOCTIIP SURVEY AREA

OCHCS Designation (Gray and Bramlet 1992)	CNDDB/Holland Designation (Holland 1986)	CNPS Designation (Sawyer and Keeler-Wolf 1995)
Southern cottonwood-willow riparian forest	Southern cottonwood-willow riparian forest (G3, S3.2)	Fremont cottonwood series
Coast live oak woodland	Coast live oak woodland (G4, S4)	Coast live oak series
Rock outcrops and xeric cliff faces	--	--
Open water	--	--
Perennial streams and rivers	--	--
Ephemeral drainages and washes	--	--

ATTACHMENT 2
NATURAL ENVIRONMENT STUDY SECTION 5.0

SECTION 5.0
BIOLOGICAL RESOURCES IN THE SOCTIIP SURVEY AREA

This section describes the biological resources that occur or potentially occur in the SOCTIIP survey area or in the immediate vicinity. Plant communities, wildlife populations and movement patterns, sensitive plant communities, and sensitive plant and wildlife species either known or potentially occurring in the survey area are discussed below. The general locations of these resources as they relate to the project alternative alignments shown earlier in Section 2.0 are given to assist the reader in locating these resources within the survey area. Graphical illustrations supporting the following discussions on sensitive and nonsensitive locations of plant communities, plant species, animal species, wildlife corridor, and habitat fragmentation are referenced in each subsection. All figures are located at the end of Section 5.0 to facilitate review of this document. Many of the figures are multiple plates. These figures depict the data gathered from the comprehensive surveys in the SOCTIIP biological study area. Quantification of the acreage of vegetation communities, sensitive plant populations, and enumeration of sensitive wildlife identified in the biological study area (BSA) during the field surveys is provided in Tables 5.0-1 through 5.0-3. Data regarding the area of developed, disturbed, and graded communities is included for comparison purposes. The totals for each biological resource represent the total amount observed in the entire BSA. Each resource total by alignment is representative of each alignment in and of itself. Because there is substantial overlap among the alternatives, it is not feasible to add the totals from each alternative to obtain the total resources in the BSA. All tables that contain area data have been revised to provide areas in acres, and hectares in parentheses below, in each cell for appropriate biological resources.

To make the document easier to read, scientific (Latin) names are generally provided in Appendix D. Common names are used throughout the text.

5.1 NATURAL COMMUNITIES

The term plant community is a general one that can be applied to vegetation types of various sizes and longevity. A number of systems have been developed for mapping plant communities (Mueller-

Dombois and Ellenberg 1974). The Orange County Habitat Classification System (OCHCS, Gray and Bramlet 1992) used to classify plant communities in Orange County divides plant communities into associations and divides associations into subassociations. An *association* is a particular type of plant community that has been described sufficiently and repeatedly in several locations such that it is considered to have (1) a relatively consistent floristic (species) composition, (2) a characteristic physiognomy (growth form or structure), and (3) a distribution that is characteristic of a particular habitat (Barbour et al. 1987). A *subassociation* is an additional division of an association into more discrete units based on floristic composition. For example, scrub communities have been divided into associations such as southern coastal bluff scrub and Venturan-Diegan transitional coastal sage scrub (CSS). No subassociations of southern coastal bluff scrub are recognized for Orange County, because the floristic composition remains fairly consistent where the association occurs in the County. The Venturan-Diegan transitional CSS association, on the other hand, has 12 recognized subassociations in the County, each of which is identified by the dominance of one to four characteristic species. The code following the plant community name refers to the code in the OCHCS. Not all associations of the OCHCS are represented in the SOCTIIP survey area. Figure 5.1-1 illustrates the areal extent of plant communities and certain land uses occurring in the SOCTIIP survey area. All figures in this Section are provided following the last page of text in this Section. Similar plant community types have been combined for simpler graphic representation (e.g., all riparian communities are shown as 7.0). Appendix D contains a list of all the plant species observed within the SOCTIIP survey area. These plant community associations in the SOCTIIP survey area are described in the following sections.

Resources are presented on up to 10 sheets. Only those sheets that contain the referenced resources are included. Therefore, sheets that do not have resources are not included.

5.1.1 SCRUB COMMUNITIES (2.0)

Scrub communities typically consist of low-growing perennial shrubs generally less than two meters (6.6 feet) high. The predominant species are mesophyllous (soft-leaved) and drought deciduous, although some evergreen sclerophyllous (hard-leaved) species may be locally common. The

associations and subassociations that comprise this type of habitat typically occur on the foothills, close to the coast, and on a variety of substrates, slopes, and aspects.

5.1.1.1 Southern Coastal Bluff Scrub (2.1)

Southern coastal bluff scrub occurs in a limited part of the SOCTIIP survey area immediately adjacent to and on either side of San Mateo Marsh, in the southeasternmost part of the survey area. This community occurs on exposed bluffs overlooking or in close proximity to the ocean. Vegetative cover is typically low to prostrate. Dominant species in the SOCTIIP survey area include California sagebrush, bluff buckwheat, lemonadeberry, California bush sunflower, coyote brush, and non-native plants, including hottentot fig and Australian saltbush. Understory components consist of purple needlegrass and non-native grasses, including oats, bromes, and barleys.

5.1.1.2 Venturan-Diegan Transitional CSS (2.3)

Venturan-Diegan transitional CSS is the dominant scrub association throughout the survey area. This association is dominated by low, generally less than 1.2 meters (four feet) tall, mesophyllous, drought deciduous species. This transitional association often contains elements of two recognized geographical associations of CSS: Venturan and Diegan. The OCHCS recognizes 12 subassociations of Venturan-Diegan transitional CSS, 10 of which occur in the SOCTIIP survey area and are described below. In addition to the subassociations, this association often integrates with grassland and chaparral communities.

California Sagebrush-California Buckwheat Scrub (2.3.1)

California sagebrush-California buckwheat scrub is a dominant scrub subassociation throughout the SOCTIIP survey area except along I-5. Vegetative cover varies from open to dense. This subassociation is dominated by California sagebrush and California buckwheat and often includes other sage scrub species where the distribution is determined by factors such as slope, aspect, and soil type. Other sage scrub species that may be codominant or subdominant include white sage, black

sage, California bush sunflower, narrow-leaved bedstraw, California wishbone bush, and coastal goldenbush. Two woody shrubs that are also common chaparral components, lemonadeberry and laurel sumac, are also common as subdominants in this community. Native bunchgrasses, including purple needlegrass, foothill needlegrass, and coast range melic, often occur as understory in the spaces between the shrubs, with the coast range melic often codominant with California sagebrush in the northernmost part of the survey area south of Oso Parkway.

The understory is rich and includes a large number of spring, summer, and fall annuals. Included in the annual plants are bulbiferous plants (e.g., mariposa lilies) and plants that overwinter by means of a caudex (e.g., East jepsonia). Common spring annuals include rattlesnake weed, California fluffweed, southern rosinweed, California chicory, Fremont's forget-me-not, common forget-me-not, bajada lupine, collar lupine, common eucrypta, Parry's phacelia, chia, California wood-sorrel, California plantain, ground pink, Turkish rugging, Padres' shooting star, Nuttall's snapdragon, Johnny jump-up, and splendid mariposa lily. Common summer and fall annuals include bicolored cudweed, cotton-batting plant, twiggy wreath plant, California figwort, soap plant, intermediate-flowered mariposa lily, and Weed's mariposa lily. Non-native species include non-native annual grasses such as oats, bromes, and rattail fescue, as well as forbs such as tocalote and horehound.

California Sagebrush-Orangebush Monkeyflower Scrub (2.3.2)

California sagebrush-orangebush monkeyflower scrub is found primarily in the northern part of the SOCTIIP survey area along the corridor alignments on mesic north- and east-facing slopes. Vegetative cover is typically dense, approaching 100 percent in mature stands. In addition to California sagebrush, dominant species include orangebush monkeyflower, coyote brush, giant wild-rye, and poison oak. Subdominants include blue elderberry, coastal goldenbush, and white sage. The understory is usually sparse to nonexistent due to the density of the shrub layer. In many instances, this subassociation may consist of dense monocultures of poison oak and orangebush monkeyflower with California sagebrush or white sage as subdominant.

Black Sage Scrub (2.3.4)

Black sage scrub occurs in the SOCTIIP survey area along all of the FEC and A7C corridor alignments. This habitat most commonly occurs on south-facing slopes with vegetative cover generally dense, often approaching 100 percent. Black sage is dominant, often forming monocultural stands. Associated species include California sagebrush, California buckwheat, bush mallow, coastal prickly pear, and narrow-leaved bedstraw.

White Sage Scrub (2.3.5)

White sage scrub occurs in part of the SOCTIIP survey area along the FEC-TV and all of the A7C corridor alignments. White sage scrub occurs on a variety of exposures, but is most commonly found on more mesic sites. Vegetative cover varies from open to dense. This subassociation is dominated by white sage, which often forms dense, monotypic stands. Associated species include California sagebrush, California buckwheat, laurel sumac, narrow-leaved bedstraw, and coast range melic. In some parts of the SOCTIIP survey area, white sage scrub is fairly open, and coast range melic occurs as a codominant species providing up to 50 percent relative cover. On drier ridgelines, particularly on sandy substrates, this subassociation is open and contains coast paintbrush, woolly Indian paintbrush, giant needlegrass, and cane bluestem.

Sagebrush Scrub (2.3.6)

Sagebrush scrub occurs sporadically in part of the SOCTIIP survey area along all of the corridor alignments and both arterial alignments. This subassociation occurs on more mesic sites and is dominated by monotypic stands of California sagebrush. Vegetative cover is typically dense and understory is sparse.

Buckwheat Scrub (2.3.7)

Buckwheat scrub occurs in the SOCTIIP survey area along all of the FEC and A7C corridor alignments and Antonio Parkway. This subassociation is dominated by monotypic stands of California buckwheat, and California sagebrush is not present. Vegetative cover is open to moderately dense. Associated species typically found in low densities include white sage, California bush sunflower, lemonadeberry, deerweed, and coastal goldenbush. Because this subassociation is somewhat open, the understory contains a high diversity, including foothill needlegrass, California everlasting, and bicolored cudweed. At some locations, this habitat occurs on revegetated slopes, such as the south-facing slope below Oso Parkway in the northernmost part of the SOCTIIP survey area.

Sagebrush-Black Sage Scrub (2.3.8)

This subassociation occurs in part of the SOCTIIP survey area along all of the FEC and CC corridor alignments and is equally dominated by California sagebrush and black sage. It is typically found on south-facing slopes, and vegetative cover is dense, approaching 100 percent cover. Associated species include orangebush monkeyflower, coastal prickly pear, and occasional individuals of lemonadeberry and laurel sumac.

Coyote Brush Scrub (2.3.9)

Coyote brush scrub occurs throughout the SOCTIIP survey area south of Ortega Highway and is most common near the coast. This subassociation is dominated by coyote brush, which occurs in open to dense monotypic stands. Associated species include California sagebrush, California buckwheat, white sage, and giant wild-rye.

Mixed Sage Scrub (2.3.10)

Mixed sage scrub occurs in limited parts of the SOCTIIP survey area along the corridor alignments, I-5, and Antonio Parkway. This subassociation is dominated by an even mix of four or more sage scrub species that may include California sagebrush, California buckwheat, California bush sunflower, black sage, and/or white sage.

Sagebrush-Coyote Brush Scrub (2.3.12)

Sagebrush-coyote brush scrub, which is generally equally dominated by California sagebrush and coyote brush, occurs in a few locations in the SOCTIIP survey area along the corridor alignments, with the most substantial stands occurring near the intersection of Cristianitos Road and El Camino Real. Associated species include white sage, blue elderberry, and coastal goldenbush.

5.1.1.3 Southern Cactus Scrub (2.4)

Southern cactus scrub occurs in limited locations, primarily in the north part of the SOCTIIP survey area along the corridor alignments. Vegetative cover is typically dense, approaching 100 percent. Coastal prickly pear comprises a minimum of 25 percent relative cover with other sage scrub species including California sagebrush, California buckwheat, black sage, white sage, blue elderberry, and California brickellbush. In some areas, coast range melic is a subdominant in this community.

5.1.1.4 Floodplain Sage Scrub (2.6)

In the SOCTIIP survey area, floodplain sage scrub is associated with San Juan, Cristianitos, and San Mateo creeks. This community is commonly associated with alluvial floodplains and can also be found colonizing sandbars and terraces in the more active parts of the channel. Vegetative cover is typically open, and dominant species include scalebroom, California buckwheat, and California brickellbush. Additional species include wild tarragon, deerweed, mule fat, sand-wash groundsel, bristly golden aster, bicolored cudweed, Sonora everlasting, and cotton-batting plant. This

association is highly dynamic, depending on the flooding regimes associated with the large drainages with which it is typically associated.

5.1.1.5 Chenopod Scrub (2.7)

Chenopod scrub is limited to the southern part of the SOCTIIP survey area, on south-facing slopes above the San Onofre State Beach campground and near the intersection of Avenida Pico and Calle Frontera. This association is dominated by Brewer's saltbush, with California sagebrush and coyote brush also present.

5.1.1.6 Sage Scrub-Grassland Ecotone/Sere (2.8)

Sage scrub-grassland ecotone/sere occurs in the SOCTIIP survey area along the corridor alignments and Antonio Parkway. This association is dominated by native and/or non-native annual grasses with a sage scrub component that is generally less than 15 percent cover. Native bunchgrasses include purple needlegrass, which is typically dominant, along with subdominants coast range melic, mesa three-awned grass, cane bluestem, and leafy bentgrass. Non-native grasses include wild oats, slender oats, soft chess, Italian ryegrass, nitgrass, and rattail fescue. Forbs are also common, particularly in the spring, and include smooth cat's ear, common goldenstar, splendid mariposa lily, blue dicks, blue-eyed grass, many-stemmed dudleya, southern rosinweed, and Turkish rugging.

Component shrubs include California sagebrush, California buckwheat, black sage, white sage, narrow-leaved bedstraw, coastal goldenbush, and cudweed aster. Five sagebrush-grassland ecotone subassociations are present in the SOCTIIP survey area: sagebrush-grassland, buckwheat-grassland, coastal goldenbush-grassland, mixed sage scrub-grassland, and mixed sage scrub-cane bluestem grassland.

Sagebrush-Grassland (2.8.1)

Sagebrush-grassland occurs in limited parts of the SOCTIIP survey area and is best represented in the northern part of the survey area along the corridor alignments and Antonio Parkway. Purple needlegrass is the dominant bunchgrass, with non-native grasses including soft chess, nitgrass, and Italian ryegrass. Common forbs include cudweed, smooth cat's ear, common goldenstar, blue dicks, splendid mariposa lily, and blue-eyed grass. California sagebrush is the common shrub.

Buckwheat-Grassland (2.8.2)

Buckwheat-grassland occurs in limited parts of the SOCTIIP survey area along the corridor alignments. Dominant species are very similar to those associated with sagebrush-grassland, with California buckwheat replacing California sagebrush as the most common shrub.

Coastal Goldenbush-Grassland (2.8.3)

Coastal goldenbush-grassland occurs in the SOCTIIP survey area along the corridor alignments, and is most commonly found in valley bottoms and the base of slopes with heavy soils. Purple needlegrass is the dominant native bunchgrass with non-native grasses, including soft chess, nitgrass, and hare barley also common and occasionally dominant. In many areas, particularly adjacent to drainages along Cristianitos Creek or Cañada Chiquita, cover of coastal goldenbush is higher than 15 percent, often reaching 40 to 50 percent. Associated species include western ragweed, mule fat, and cudweed. Where this community is found on the lower parts of slopes, cover of coastal goldenbush is generally 15 percent or less.

Mixed Sage Scrub-Grassland (2.8.5)

Mixed sage scrub-grassland in the SOCTIIP survey area is limited in distribution to the north part of the survey area east of Oda Nursery by the FEC alignment. Dominant native bunchgrasses include purple needlegrass and cane bluestem, with leafy bentgrass subdominant. Non-native grasses include

soft chess, nitgrass, and wild oats. Forbs include smooth cat's ear, splendid mariposa lily, intermediate mariposa lily, Weed's mariposa lily, common goldenstar, fascicled tarweed, San Diego tarweed, and many-stemmed dudleya. Shrubs include California sagebrush, California buckwheat, black sage, coastal goldenbush, and narrow-leaved bedstraw.

Mixed Sage Scrub-Cane Bluestem Grassland (2.8.6)

Mixed sage scrub-cane bluestem grassland is limited in distribution in the SOCTIIP survey area in the area north of Ortega Highway. This subassociation is typically ecotonal between sandy outcrop areas and either CSS or sage scrub-grassland areas dominated by purple needlegrass. Vegetative cover is open, and cane bluestem is the dominant grass, with purple needlegrass either not present or present in low numbers. Giant needlegrass and mesa three-awned grass are common, as is the native annual grass littleseed muhly. Common shrubs include California sagebrush, white sage, narrow-leaved bedstraw, and California buckwheat. Additional shrubs include woolly Indian paintbrush and coast paintbrush. Because the habitat is fairly open, the understory is diverse, including many-stemmed dudleya, Turkish rugging, southern rosinweed, intermediate mariposa lily, Weed's mariposa lily, and California fluffweed.

5.1.2 CHAPARRAL COMMUNITIES (3.0)

Chaparral communities are characterized by evergreen shrubs up to four meters (13 feet) high. The vegetation is predominantly sclerophyllous, and occurs most commonly on north-facing slopes of the foothills, often extending to the coast. In the SOCTIIP survey area, chaparral often integrates with subassociations of Venturan-Diegan transitional CSS.

5.1.2.1 Coastal Sage-Chaparral Scrub Ecotone/Sere (3.1)

Coastal sage-chaparral scrub ecotone/sere represents a gradation or intermingling of components of these scrub communities. The association is ecotonal where mature CSS and chaparral communities intergrade such that no components of either community are clearly dominant. In other instances, the

presence of both sage scrub and chaparral elements is indicative of a seral or successional site where early successional elements (sage scrub) are being replaced by later successional elements (chaparral). Two sage scrub-chaparral scrub ecotones/seres are associated with the SOCTIIP survey area: chamise-sage scrub and maritime chaparral-sagebrush, as described in the following sections.

Chamise-Sage Scrub (3.1.2)

Chamise-sage scrub is limited in distribution in the SOCTIIP survey area along the corridor alignments. Chamise is the dominant chaparral component, with California sagebrush and black sage as the dominant sage scrub species.

Maritime Chaparral-Sagebrush (3.1.5)

Maritime chaparral-sagebrush is limited in distribution in the SOCTIIP survey area to an area west of the TRW facility near the FEC alignments. Vegetative cover is dense, approaching or reaching 100 percent cover. Dominant chaparral species include lemonadeberry, laurel sumac, and scattered individuals of toyon. California sagebrush is the dominant sage scrub component. Understory is generally sparse or nonexistent due to the dense canopy. This subassociation integrates with maritime chaparral and oak woodland.

5.1.2.2 Southern Mixed Chaparral (3.2)

Southern mixed chaparral in the SOCTIIP survey area is located north of Ortega Highway. This association is comprised of chamise, laurel sumac, toyon, and lemonadeberry. It is typically found on north-facing slopes with vegetative cover usually dense, approaching 100 percent. The understory is usually sparse and includes herbs such as common chickweed and California thread-stem. This association integrates with toyon-sumac chaparral (3.12) or various subassociations of Venturan-Diegan transitional CSS.

5.1.2.3 Chamise Chaparral (3.3)

Chamise chaparral is limited in distribution in the SOCTIIP survey area to an area north of Ortega Highway. This association is dominated by chamise, which often forms dense monotypic stands. Vegetative cover varies from somewhat open to dense, approaching 100 percent cover. Associated species, which are present as scattered individuals, include black sage, lemonadeberry, and scrub oak. Understory species include peak rush-rose, California fluffweed, intermediate mariposa lily, Weed's mariposa lily, and canchalagua.

5.1.2.4 Scrub Oak Chaparral (3.7)

Scrub oak chaparral is limited in distribution in the SOCTIIP survey area to an area north of Ortega Highway. This association, which is typically associated with north-facing slopes, is dominated by scrub oak that often forms dense, monotypic stands. Vegetative cover varies from somewhat open to dense, approaching 100 percent cover. Other species that may share dominance include toyon, lemonadeberry, and laurel sumac. Where canopy cover is dense, understory is sparse. In areas that are more open, the understory includes poison oak and California goldenrod. This association often integrates with toyon-sumac chaparral (3.12).

5.1.2.5 Toyon-Sumac Chaparral (3.12)

Toyon-sumac chaparral occurs in the SOCTIIP survey area along the corridor alignments and along I-5. This association occurs primarily on north- and east-facing slopes and is dominated in the survey area by lemonadeberry, laurel sumac, and, to a lesser extent, toyon. Occasional individuals of scrub oak are also present. Vegetative cover is typically dense, approaching 100 percent cover with little or no understory. This association integrates with scrub oak chaparral (3.7) and maritime chaparral-sagebrush (3.1.5).

5.1.3 GRASSLAND COMMUNITIES (4.0)

Grassland communities are characterized by both native bunchgrasses and non-native annual grasses. Native bunchgrasses may occur in nearly pure stands, or stands may contain a significant component of non-native annual grasses. Where native bunchgrasses comprise at least 10 percent of the relative cover, the area is mapped as native grassland (Keeley 1989). Both the native and non-native grasslands support a large number of native and non-native forbs.

5.1.3.1 Annual Grassland (4.1)

Annual grassland is the most common vegetation association in the SOCTIIP survey area, occurring along the corridor alignments and Antonio Parkway. The presence of annual grassland is generally indicative of past disturbance that has resulted in the conversion of native habitats, such as CSS, chaparral, or native bunchgrass, into annual grasslands dominated by grasses and forbs that are of Mediterranean origin. Non-native annual grasses include wild oats, slender oats, ripgut grass, soft chess, and hare barley. These species germinate in December and January, and set seed by March during the period of highest soil moisture. Later in the season, Italian ryegrass becomes dominant, forming dense monocultures previously occupied by the oats and bromes.

Annual forbs make up a significant component of the annual grassland in the SOCTIIP survey area. Common forbs include Indian milkweed, tocalote, common fiddleneck, rusty popcornflower, black mustard, field mustard, common catchfly, stickwort, miniature lupine, whitewhorl lupine, California burclover, bristled clover, red-stemmed filaree, white-stemmed filaree, and fluellin. San Diego tarweed, fascicled tarweed, and dove weed are dominant in late summer and fall.

Large parts of the annual grassland south of Ortega Highway are dominated by dense stands of the invasive exotic cardoon.

5.1.3.2 Leymus Grassland (4.2)

Beardless Wild-Rye Grassland (4.2.1)

Leymus grassland, dominated by beardless wild-rye, is limited in distribution to a few locations in the SOCTIIP survey area south of Ortega Highway along the corridor alignments. This association typically consists of dense, often monotypic stands of beardless wild-rye in upper floodplain areas with alkaline soils. Associated species include western ragweed and coastal goldenbush.

Giant Wild-Rye Grassland (4.2.2)

Leymus grassland dominated by giant wild-rye occurs in small dense stands on north-facing slopes in the SOCTIIP survey area south of Ortega Highway along the corridor alignments. This association is typically found in ravines/canyons and consists of monocultural stands of giant wild-rye.

5.1.3.3 Southern Coastal Needlegrass Grassland (4.3)

Southern coastal needlegrass grassland occurs in the SOCTIIP survey area along the corridor alignments and Antonio Parkway. This association occurs as small pockets in CSS or as large open grasslands dominated by purple needlegrass. Although this association is typically dominated by purple needlegrass, more disturbed grasslands or relict grasslands, which are comprised of 10 percent cover of purple needlegrass or associated bunchgrasses, are considered to meet the criteria for this association. Associated bunchgrass species, which are sometimes locally dense but not dominant over large areas, include leafy bentgrass, junegrass, cane bluestem, and coast range melic. Non-native grasses include wild oats, slender oats, soft chess, Italian ryegrass, nitgrass, and rattail fescue. Forbs are also common, particularly in the spring, and include smooth cat's ear, common goldenstar, splendid mariposa lily, blue dicks, blue-eyed grass, many-stemmed dudleya, and southern rosinweed. San Diego tarweed, fascicled tarweed, and dove weed are predominant in late summer and fall.

5.1.3.4 Deergrass Grassland (4.4)

Deergrass grassland is restricted to one occurrence in the SOCTIIP survey area approximately 200 meters (656 feet) south of the intersection of Clay Pile Road and San Juan Ridge Road along the FEC alignment. The deergrass grassland, dominated by deergrass, occurs in a swale surrounded by purple needlegrass grassland. Associated species include Mexican rush, wrinkled rush, creeping spikerush, and needle spikerush.

5.1.3.5 Ruderal (4.6)

Ruderal habitat occurs throughout the SOCTIIP survey area except along the A7C-OHV and A7C-ALPV Alignments, and is typically associated with areas subject to substantial disturbance. The types of vegetation vary according to the nature and severity of the disturbance and generally include black mustard, shortpod mustard, tocalote, Russian thistle, cardoon, milk thistle, Australian saltbush, and cheeseweed. Non-native annual grasses such as oats, bromes, and barleys are often a substantial component of ruderal areas. However, ruderal areas can be distinguished from annual grassland (4.1) by a greater dominance of species such as mustard rather than grass species.

5.1.4 VERNAL POOLS, SEEPS, AND WET MEADOWS (5.0)

Vernal pools, seeps, and wet meadows comprise a variety of wetland associations/subassociations with distinctively different hydrological conditions. All these wetland habitats support hydrophytic, water-loving vegetation that is adapted to survive prolonged periods of inundation or saturation in the root zone. In general, these habitats tend to be small in areal extent, usually less than 0.4 hectare (1.0 acre), with the exception of the wet meadow area immediately south of Oso Parkway.

5.1.4.1 Southern Hardpan Vernal Pool (5.1) and Vernal Pool-Like Ephemeral Pond

Vernal pools are depressions that pond shallow water following winter and spring rains due to an impervious hardpan that prevents percolation of the ponded water. In coastal southern California,

vernal pools are often associated with heavy clay soils in which the clay provides the impervious hardpan. Vernal-poollike ephemeral ponds and human-made ponds are also included in this category. Slump pools or human-made pools are small swales or basalt-flow depression basins with a grainy or muddy bottom topography located in upland grassland habitats. These ponds are derived from geological activity such as faulting or landscape movement. In the SOCTIIP survey area, vernal pools are distinguished from other seasonal wetland habitats by basin topography and the presence of indicator plant species (Zedler 1987). For this survey, a basin was defined as a vernal pool if it contains at least one indicator species from Zedler (1987).

Southern hardpan vernal pool habitat occurs in limited locations in the SOCTIIP survey area along the corridor alignments. Vernal pools were observed along Chiquita Ridge, on the upper floodplain of San Juan Creek, and on Marine Corps Base (MCB) Camp Pendleton near Basilone Road. The vernal pool on Chiquita Ridge contains bracted vervain, creeping spikerush, marsh cudweed, and curly dock. The vernal pools above San Juan Creek support marsh cudweed and hyssop loosestrife. The vernal pool near Basilone Road supports dwarf woolly heads.

5.1.4.2 Alkali Meadow (5.2)

Alkali meadow occurs in the SOCTIIP survey area along the corridor alignments, and is most predominant along Cañada Chiquita in the northern part of the survey area. Alkali meadow also occurs in Prima Deshecha and Segunda Deshecha creeks. This habitat is associated with seeps, floodplains, and other vernally wet areas with saline or alkaline soils. Salinities range between 0.5 and 5.0 parts per thousand (ppt) with electroconductivity (micromhos, µMhos) between 800 and 8,000. This community often integrates with freshwater marsh, but occurs where lack of flooding or flushing allows buildup of saline or alkaline conditions. Vegetation consists of herbaceous perennial species and some annuals. In the survey area, characteristic species include saltgrass, low barley, yerba mansa, rabbitsfoot grass, western ragweed, southern tarweed, Mexican rush, and bermuda grass.

5.1.4.3 Seeps (5.3)

Freshwater Seep (5.3.1)

One freshwater seep was observed in the SOCTIIP survey area near the southern end of Sulfur Canyon. Dominant hydrophytic species include cut-leaf water parsnip, creeping spikerush, needle spikerush, Mexican rush, wild celery, and Olney's bulrush.

Alkali Seep (5.3.2)

Alkali seeps are limited in distribution to the northern portions of the SOCTIIP survey area, primarily adjacent to Cañada Chiquita. In the survey area, this habitat is associated with isolated perennial sources of water that have salinities between 0.5 and 5.0 ppt and electroconductivity between 800 and 8,000 µMhos. The vegetation is dense and consists of hydrophytic species including clustered field sedge, beaked spikerush, needle spikerush, Mexican rush, wild celery, marsh fleabane, salt spring checkerbloom, southern tarweed, and Olney's bulrush.

5.1.4.4 Freshwater Swale (5.4)

One freshwater swale was observed in the SOCTIIP survey area near I-5 northwest of the intersection of Avenida Vista Hermosa with I-5. A swale is a broad drainage with no clear beds or banks and is vegetated on the bottom. Typical species include beard grass, rush, celery, cocklebur, and western ragweed.

5.1.4.5 Southern Vernal Marsh (5.5)

Southern vernal marsh habitat occurs in limited locations in the SOCTIIP survey area along the corridor alignments. There is a high concentration of small vernal marshes between San Juan Creek and Ewles Materials on the terrace above and adjacent to San Juan Creek along the FEC alignment. The vernal marshes occur in basins often created inadvertently by earthmoving and borrow activities.

Hydrologically, these basins are similar to vernal pools; however, they are often deeper and, therefore, longer-lived. This habitat is distinguished from vernal pool habitat by the lack of vernal pool indicator species, specifically species from Table 6A of Zedler (1987), such as dwarf wooly heads, marsh cudweed, or hyssop loosestrife. In the survey area, vernal marsh habitat is dominated by needle spikerush, rabbitsfoot grass, curly dock, and mule fat. All vernal marshes were surveyed for listed fairy shrimp species according to USFWS protocols.

5.1.5 MARSH COMMUNITIES (6.0)

Marsh communities occur in the SOCTIIP survey area along all of the FEC and the A7C-FECV alignments and include marshes with saline, brackish, and freshwater conditions. These habitats are supported by a variety of hydrological regimes. Vegetation consists primarily of herbaceous perennial hydrophytes with occasional annual hydrophytes.

5.1.5.1 Southern Coastal Salt Marsh (6.1)

Southern coastal salt marsh is limited in distribution in the SOCTIIP survey area near the northwest corner of San Mateo Marsh. The area is dominated by fleshy jaumea, pickleweed, and saltgrass. No other salt marsh species were observed.

5.1.5.2 Coastal Brackish Marsh (6.2)

Coastal brackish marsh is limited in distribution to one location in the SOCTIIP survey area at the southern end of the corridor alignments in Trestles Natural Wetland Preserve. This area is dominated by fleshy jaumea, yerba mansa, Mexican rush, and saltgrass.

5.1.5.3 Cismontane Alkali Marsh (6.3)

Cismontane alkali marsh is limited in the SOCTIIP survey area to portions of Cañada Chiquita near Oso Parkway along the corridor alignments and in Prima Deshecha and Segunda Deshecha creeks. In

Cañada Chiquita, this habitat integrates with alkali meadow and forms a larger wetland complex. This association is present where groundwater is high (at or near the surface) and is characterized by emergent wetlands vegetation with an understory of hydrophytic grasses and sedges. In the marsh in Cañada Chiquita, emergents include southern cattail, narrow-leaved cattail, Olney's bulrush, rough vervain, and California bulrush. Understory elements include clustered field sedge, creeping spikerush, needle spikerush, Mexican rush, wild celery, marsh fleabane, rabbitsfoot grass, saltgrass, and yerba mansa.

5.1.5.4 Coastal Freshwater Marsh (6.4)

Coastal freshwater marsh occurs in the SOCTIIP survey area along the corridor alignments and I-5. Coastal freshwater marsh is found in areas that are seasonally or permanently flooded or inundated. This association occurs in low lying areas, such as at San Mateo Marsh, as well as along many of the drainages in the survey area, such as San Juan, San Mateo, and Cristianitos creeks, and Cañada Chiquita. Vegetation is open to dense and includes a high diversity of emergent hydrophytes such as southern cattail, narrow-leaved cattail, California bulrush, Olney's bulrush, alkali bulrush, common bulrush, small-fruited bulrush, creeping spikerush, needle spikerush, iris-leaved rush, wrinkled rush, tall umbrella-sedge, brown umbrella sedge, fragrant umbrella sedge, and yellow umbrella sedge.

Forbs include marsh fleabane, rough vervain, common monkeyflower, scarlet monkeyflower, willow smartweed, water smartweed, whorled dock, willow dock, willow-herb, yellow waterweed, cut-leaf water parsnip, slender aster, rosilla, western goldenrod, white watercress, and giant nettle.

Grasses include rabbitsfoot grass, knot grass, water bent, dense-flowered sprangletop, and western witchgrass.

5.1.6 RIPARIAN COMMUNITIES (7.0)

Riparian communities are associated with the bottoms, banks, and occasionally the floodplains of various drainages throughout the SOCTIIP survey area. Included are both perennial and intermittent drainages. Vegetation consists of trees, shrubs, perennial herbs, and annual species.

5.1.6.1 Riparian Herb (7.1)

Riparian herb is limited in distribution in the SOCTIIP survey area to a few drainage ditches along the corridor alignments and Antonio Parkway. Dominant vegetation includes tall nutsedge, rabbitsfoot grass, bermuda grass, Mexican rush, and cocklebur.

5.1.6.2 Southern Willow Scrub (7.2)

Southern willow scrub is limited in distribution to one drainage south of Ortega Highway. This association is generally dense and is dominated by arroyo willow with an understory of herbaceous hydrophytes.

5.1.6.3 Mule Fat Scrub (7.3)

Mule fat scrub occurs throughout the SOCTIIP survey area along and in numerous intermittent drainages. The association varies from open to dense and is dominated by mule fat with occasional individuals of arroyo willow, red willow, and narrow-leaved willow. Understory varies from sparse to dense and may include bermuda grass, saltgrass, cocklebur, rabbitsfoot grass, Mexican tea, and western ragweed. In wetter areas, the understory is composed of wrinkled rush, creeping spikerush, and Mexican rush.

5.1.6.4 Southern Sycamore Riparian Woodland (7.4)

Southern sycamore riparian woodland, which is dominated by western sycamore, occurs in the SOCTIIP survey area along the corridor alignments and I-5 and is typically associated with the floodplains and upper terraces of larger streams such as San Juan, Cristianitos, and San Mateo creeks. Associated species include coast live oak, blue elderberry, arroyo willow, red willow, and black willow. Understory shrubs include poison oak, which often forms dense monocultures, along with mule fat, Douglas' nightshade, and mugwort. This association often integrates with southern coast live oak riparian forest (7.5) and southern arroyo willow riparian forest (7.6).

5.1.6.5 Southern Coast Live Oak Riparian Forest (7.5)

Southern coast live oak riparian forest occurs in the SOCTIIP survey area along the corridor alignments and is often associated with the floodplains and upper terraces of larger streams such as San Juan, Cristianitos, and San Mateo creeks, and along smaller intermittent drainages. Associated species include western sycamore, blue elderberry, arroyo willow, red willow, and black willow. Understory components include poison oak, mule fat, Douglas' nightshade, and mugwort. This association often integrates with southern sycamore riparian woodland (7.4) and southern arroyo willow riparian forest (7.6).

5.1.6.6 Southern Arroyo Willow Riparian Forest (7.6)

Southern arroyo willow riparian forest occurs in the SOCTIIP survey area along the corridor alignments and I-5 and is associated with lower floodplains and channel banks of intermittent or perennial streams. The association is dominated by arroyo willow, and often red willow and black willow are also present in smaller numbers. Vegetative cover varies from open to dense with the willows often forming dense, impenetrable thickets. Understory varies according to wetness. In wetter areas, the understory consists of southern cattail, California bulrush, tall umbrella-sedge, whorled dock, willow dock, and cut-leaf water-parsnip. The southern arroyo willow riparian forest associated with San Mateo Creek, east of the Interstate 5 (I-5) bridge, contains scattered stands of bur

reed and dense stands of giant nettle. Drier areas contain poison oak, mugwort, and nightshade as dominants in the understory with occasional individuals of mule fat.

5.1.6.7 Southern Black Willow Riparian Forest (7.7)

Southern black willow riparian forest is limited in distribution in the SOCTIIP survey area along the corridor alignments. This association is dominated by black willow, with arroyo willow present in smaller numbers in the uppermost canopy. This forest type has a multilayered structure and typically consists of arroyo willow and mule fat in the second canopy layer, with coast live oak and sycamore occasionally present. Common understory components of this community include poison oak, nettle, mugwort, western ragweed, and nightshade.

5.1.6.8 Southern Cottonwood-Willow Riparian Forest (7.8)

Southern cottonwood-willow riparian forest is limited in distribution to two areas in the San Mateo Marsh: one east and one west of the I-5 bridge. This association is dominated by black willow, black cottonwood, and Fremont cottonwood. The canopy is typically fairly dense to closed, and the understory is dense, consisting of mule fat, giant nettle, and hydrophytes such as California bulrush and spreading rush in low wetter areas, and poison oak and Douglas' nightshade in drier areas.

5.1.6.9 Bramble Thicket (7.11)

Bramble thicket is limited in distribution to one location in the SOCTIIP survey area in Cristianitos Creek, where it co-occurs with southern arroyo willow riparian forest. This thicket is dominated by perennial vines and shrubs, including California blackberry and California wild rose.

5.1.7 WOODLAND COMMUNITIES (8.0)

Woodland communities occur throughout the SOCTIIP survey area and are distinguished from forest habitats by having generally less than 60 percent canopy cover. Understory species include shrubs, grasses, and forbs.

5.1.7.1 Coast Live Oak Woodland (8.1)

Coast live oak woodland occurs throughout the SOCTIIP survey area. The canopy is open and dominated by coast live oak with occasional individuals of blue elderberry. Associated shrubs include toyon, California coffeeberry, fuchsia-flowered gooseberry, and occasional thickets of poison oak. Understory components include non-native grasses such as oats and bromes as well as native grasses including giant wild-rye, coast range melic, and alkali dropseed. Forbs include California goldenrod, miners lettuce, common chickweed, common eucrypta, and common phacelia.

5.1.7.2 Blue Elderberry Woodland (8.4)

Blue elderberry woodland is limited in distribution in the SOCTIIP survey area to a few locations in Cañada Chiquita, where it is associated with ravine tributaries to Cañada Chiquita, and to two stands near San Mateo Marsh. The ravine-associated stands in Cañada Chiquita are typically linear, following the ravine, with CSS understory components such as California sagebrush, California buckwheat, and lemonadeberry. One stand in the San Mateo Marsh area occurs on a south-facing slope with an understory of CSS components, while the other stand occurs along the margin of an agricultural field and is associated with arroyo willow and western sycamores with an understory dominated by ruderal species including black mustard and castor bean.

5.1.8 CLIFF AND ROCK COMMUNITIES (10.0)

Cliff and rock outcrops occur throughout the SOCTIIP survey area and support a diversity of shrubs and forbs. Vegetative cover is typically open to sparse.

5.1.8.1 Rock Outcrops and Xeric Cliff Faces (10.3)

Rock outcrops, consisting of exposures of Cieneba complex sandstones, occur in the SOCTIIP survey area along the corridor alignments. These outcrop areas support a diversity of sage scrub species as well as a high diversity of forbs and grasses. Shrubs include narrow-leaved bedstraw, white sage, California sagebrush, cudweed aster, and lemonadeberry. Forbs include southern rosinweed, many-stemmed dudleya, Turkish rugging, ladies-fingers, California plantain, sapphire woolly star, artemisia-leaved pincushion, Weed's mariposa lily, intermediate mariposa lily, California fluffweed, and Bigelow's spikemoss. Grasses include mesa three-awned grass, giant needlegrass, cane bluestem, foothill needlegrass, and littleseed muhly. This habitat integrates with chaparral, CSS, and most often with sage scrub-grassland ecotone.

5.1.9 MARINE AND COASTAL COMMUNITIES (11.0)

Marine and coastal habitats occur along the coastal shore and at inland areas where salt water mixes with fresh water.

5.1.9.1 Beach (11.4)

Sandy beach occurs at the southernmost limit of the SOCTIIP survey area. These areas are generally unvegetated and used as recreational areas.

5.1.10 LAKES, RESERVOIRS, AND BASINS (12.0)

A variety of basins that have standing water either year-round or at least for the majority of the year occur throughout the SOCTIIP survey area. These areas are distinguished from the more ephemeral basins such as vernal pools, which tend to have water only during high rainfall years and then for a short duration (typically less than 60 days).

5.1.10.1 Open Water (12.1)

A number of ponds, generally associated with ranching and agricultural practices, are located in the SOCTIIP survey area along the corridor alignments. Many of these ponds are seasonal, filling in spring as a result of runoff and drying through summer or fall. Other ponds are kept full throughout the year, with spring runoff augmented by pumping. Vegetation includes aquatic species such as fennel-leaved pondweed, common water nymph, and hornwort; emergent hydrophytes including southern cattail, California bulrush, tall umbrella-sedge, knot grass, and creeping spikerush; and terrestrial species such as swamp Timothy, toad rush, hyssop loosestrife, and cocklebur.

5.1.10.2 Basins (12.3)

A detention basin is located in the southern part of the SOCTIIP survey area east of I-5 in the vicinity of the San Onofre Nuclear Generating Station (SONGS). Vegetation at the perimeter of the basin is dominated by non-native species, including shortpod mustard, Russian thistle, ripgut grass, and tocalote.

5.1.11 WATERCOURSES (13.0)

Open water and unvegetated areas associated with the various drainages in the SOCTIIP survey area were mapped separately from those areas that support riparian vegetation (7.0).

5.1.11.1 Perennial Streams and Rivers (13.1)

Perennial streams and rivers include San Juan, San Mateo, and Cristianitos Creeks, Cañada Chiquita, Prima Deshecha Cañada, and Segunda Deshecha Cañada. Parts of these drainages are unvegetated and mapped as 13.1 that, in this case, designate unvegetated portions of these drainages. Because these are dynamic, high-energy systems, the active portion of the channel may periodically move, with subsequent changes in the vegetation. Vegetation maps for these systems may change dramatically from year to year based on annual rainfall.

5.1.11.2 Intermittent Streams and Creeks (13.2)

Intermittent streams and creeks are present in the SOCTIIP survey area along the corridor alignments. Where such features are vegetated, they are covered as a separate habitat type such as mule fat scrub (7.3). Where these features support little or no vegetation, they are mapped as 13.2. Because these areas are subject to scouring by flood events during high rainfall years, periodic changes in the vegetation may occur. Vegetation maps for these systems may change dramatically from year to year based on such flooding.

5.1.11.3 Ephemeral Drainages and Washes (13.3)

Ephemeral drainages and washes are present in the SOCTIIP survey area along the corridor alignment. Where such features are vegetated, they are covered as a separate habitat type such as riparian herb (7.1). Where these features support little or no vegetation, they are mapped as 13.3. Because these areas are subject to scouring by flood events during high rainfall years, periodic changes in the vegetation may occur. Vegetation maps for these systems may change from year to year based on such flooding.

5.1.12 AGRICULTURE (14.0)

A variety of agricultural areas that support both food crops and nursery stock were mapped throughout the SOCTIIP survey area.

5.1.12.1 Dryland Field Crops (14.1)

Dryland field crops occur throughout the SOCTIIP survey area, but are concentrated in the RMV area north and south of Ortega Highway. These barley crops are grown for cattle grazing. Other species present include native and non-native grasses and forbs.

5.1.12.2 Irrigated Row and Field Crops (14.2)

Irrigated row crops, including crops such as tomatoes, occur immediately above San Mateo Marsh.

5.1.12.3 Vineyards and Orchards (14.3)

Orchards for lemons, oranges, and avocados occur north of Ortega Highway in the vicinity of Oda Nursery and other locations in Cañada Chiquita.

5.1.12.4 Dairies, Stockyards, and Stables (14.4)

Horse and cattle stockyards and stables occur periodically within the RMV portion of the survey area. The stockyards and stables have limited botanical value. Plant species, if present, are limited to non-native grasses and forbs.

5.1.12.5 Nurseries (14.6)

Commercial nurseries occur in the SOCTIIP survey area along all of the FEC and CC corridor alignments. These nurseries are located in Cañada Chiquita and along San Juan Creek. Plants present in the nurseries are limited to potted ornamental shrubs and trees.

5.1.13 DEVELOPED AREAS (15.0)

Areas identified as developed occur in the SOCTIIP survey area along all of the alternatives and primarily include urban areas and roads.

5.1.13.1 Urban (15.1)

Urban areas include buildings and pavement in the SOCTIIP survey area which occur along all alternatives except for the FEC-OHV alternative.

5.1.13.2 Rural (15.2)

Rural areas (rural residential) occur at the fringes of the urban areas in the SOCTIIP survey area along the corridor alignments.

5.1.13.3 Nonurban Commercial/Industrial/Institutional (15.3)

Nonurban areas in the SOCTIIP survey area include buildings and various land uses occurring on MCB Camp Pendleton and at SONGS.

5.1.13.4 Transportation (15.4)

Freeways and other arterials are located in the SOCTIIP survey area.

5.1.13.5 Ornamental Landscaping (15.5)

Ornamental groundcovers, shrubs, and trees occur in the SOCTIIP survey area.

5.1.14 DISTURBED AREAS (16.0)

Disturbed areas occur in the SOCTIIP survey area. The vegetation in disturbed areas has been altered such that native species do not represent a dominant feature.

5.1.14.1 Cleared or Graded Areas (16.1)

Cleared and/or graded areas occur throughout the SOCTIIP survey area.

5.1.14.2 Other Disturbed Areas (16.2)

Additional disturbed areas include a small dirt and gravel area in the southern part of the survey area near SONGS.

5.1.14.3 Mined Areas (16.4)

Mined areas, primarily for clay and sand, occur between Ortega Highway and TRW Road east of Cristianitos Road along the east boundary of the SOCTIIP survey area.

5.2 FAUNA INVENTORY

5.2.1 INVERTEBRATES

Searches for invertebrates focused solely on vernal pool branchiopods, specifically, potentially occurring sensitive fairy shrimp (Order Anostraca) species. The results of the surveys are summarized in Table 5.2-1. The locations of potentially impacted fairy shrimp are displayed in Figure 5.3-2.

Fairy shrimp are small aquatic crustaceans within the Class Branchiopoda that live and reproduce in temporary (nonmarine) open water pools and basins. Branchiopoda, which literally translated means gill-feet, refers to the presence of gilled swimming appendages. It is this feature, along with the possession of a filter-feeding apparatus called a ventral food groove, which distinguishes this Class from other crustaceans.

The highly ephemeral and often unpredictable nature of a fairy shrimp's aqueous environment is reflected in its reproductive strategies; the most notable aspect of which is the production of resting eggs, also called cysts, in times of osmotic stress and/or pond dry-down. Cysts are actually dormant embryos that are encased in a multilayered, desiccation-resistant shell. The embryos can remain in this state of suspended development, or diapause, until conditions are once again favorable for their emergence. Because of the often dry and unpredictable nature of the environment where fairy shrimp are found, it is not surprising that these cysts are well adapted to long periods of drought and fluctuating ambient temperatures. The reported tolerance of cysts to extreme conditions is remarkable. It has been shown that they can often remain viable even after being subjected to months of freezing temperatures, exposure to near boiling-point heat and 10 years of near-vacuum conditions (Carlisle 1968; Clegg 1967). Cysts are also impervious to the catabolic enzymes found in the digestive tracts of animals, and as a result, can be effectively dispersed when egg-laden females are ingested by foraging birds or other vernal pool predators.

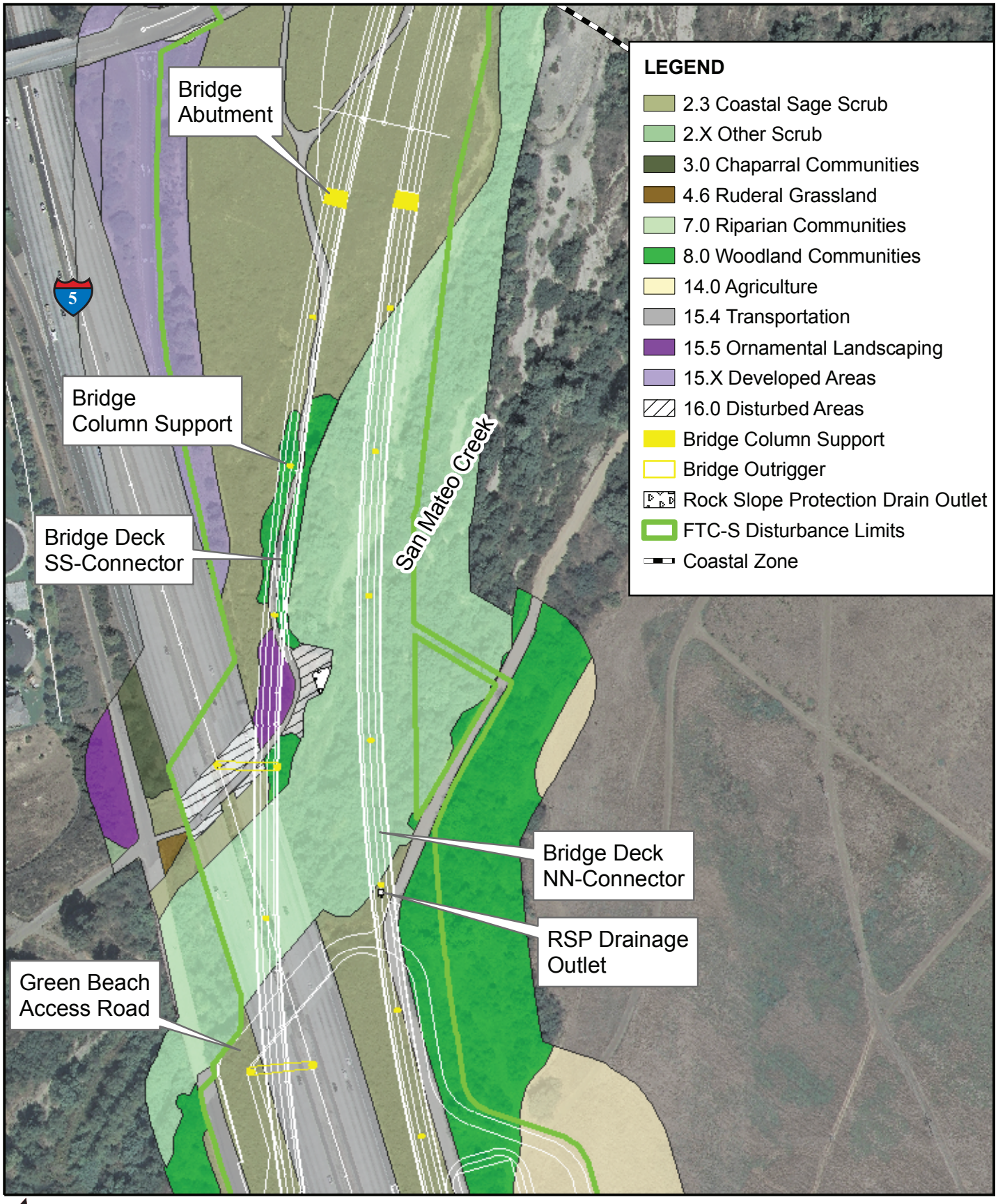
ATTACHMENT 3

TABLE OF TEMPORARY IMPACTS IN THE COASTAL ZONE

TABLE OF TEMPORARY IMPACTS IN THE COASTAL ZONE

Temporary	Existing Road I-5	Existing Road Old Highway 101	Falsework NN Connector	Falsework San Onofre Creek	Falsework SS Connector	Graded Slope	Maintenance of Traffic	Remedial Grading	ROW	Seismic Retrofit San Onofre Creek	Staging Area	Utility Relocation	Total Acres
2.3 Coastal Sage Scrub	0.06	0.16	2.43	0.40	4.73	8.20	3.96	4.13	0.00	0.00	4.22	0.48	**28.77**
2.8 Coastal Sage Scrub/Grassland Ecotone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
2.X Other Scrub	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	**0.05**
3.0 Chaparral Communities	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.02**
4.1 Annual Grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
4.6 Ruderal Grassland	0.00	0.03	0.00	0.00	0.00	0.29	0.00	0.00	1.34	0.00	0.00	0.00	**1.67**
4.X Native Grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
5.0 Vernal Pools, Seeps, & Wet Meadows	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	**0.23**
6.0 Marsh Communities	0.00	0.07	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.03	**0.42**
7.0 Riparian Communities	0.00	0.06	3.83	0.40	1.84	0.00	0.00	0.89	0.00	0.11	0.00	0.13	**7.28**
8.0 Woodland Communities	0.00	0.00	0.01	0.00	1.28	0.14	0.00	0.19	0.00	0.00	0.05	0.57	**2.25**
10.0 Cliff & Rock Communities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
12.0 Lakes, Reservoirs, & Basins	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
13.0 Water Courses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
14.0 Agriculture	0.00	0.00	0.00	0.00	0.00	0.10	0.00	1.54	0.00	0.00	0.00	0.01	**1.66**
15.4 Transportation	31.26	9.46	0.31	0.56	2.61	5.55	0.50	0.31	0.09	0.83	0.79	0.27	**52.55**
15.5 Ornamental Landscaping	0.03	0.08	0.00	0.08	0.22	0.00	0.00	0.00	0.00	0.02	0.00	0.00	**0.44**
15.X Developed Areas	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.12	0.00	0.00	1.89	0.00	**2.07**
16.0 Disturbed Areas	0.00	0.00	0.01	0.00	0.37	0.00	0.00	1.04	0.00	0.00	0.00	0.05	**1.47**
Total Acres	**31.35**	**9.87**	**6.59**	**1.60**	**11.06**	**14.34**	**4.69**	**8.23**	**1.43**	**1.15**	**6.97**	**1.59**	**98.87**

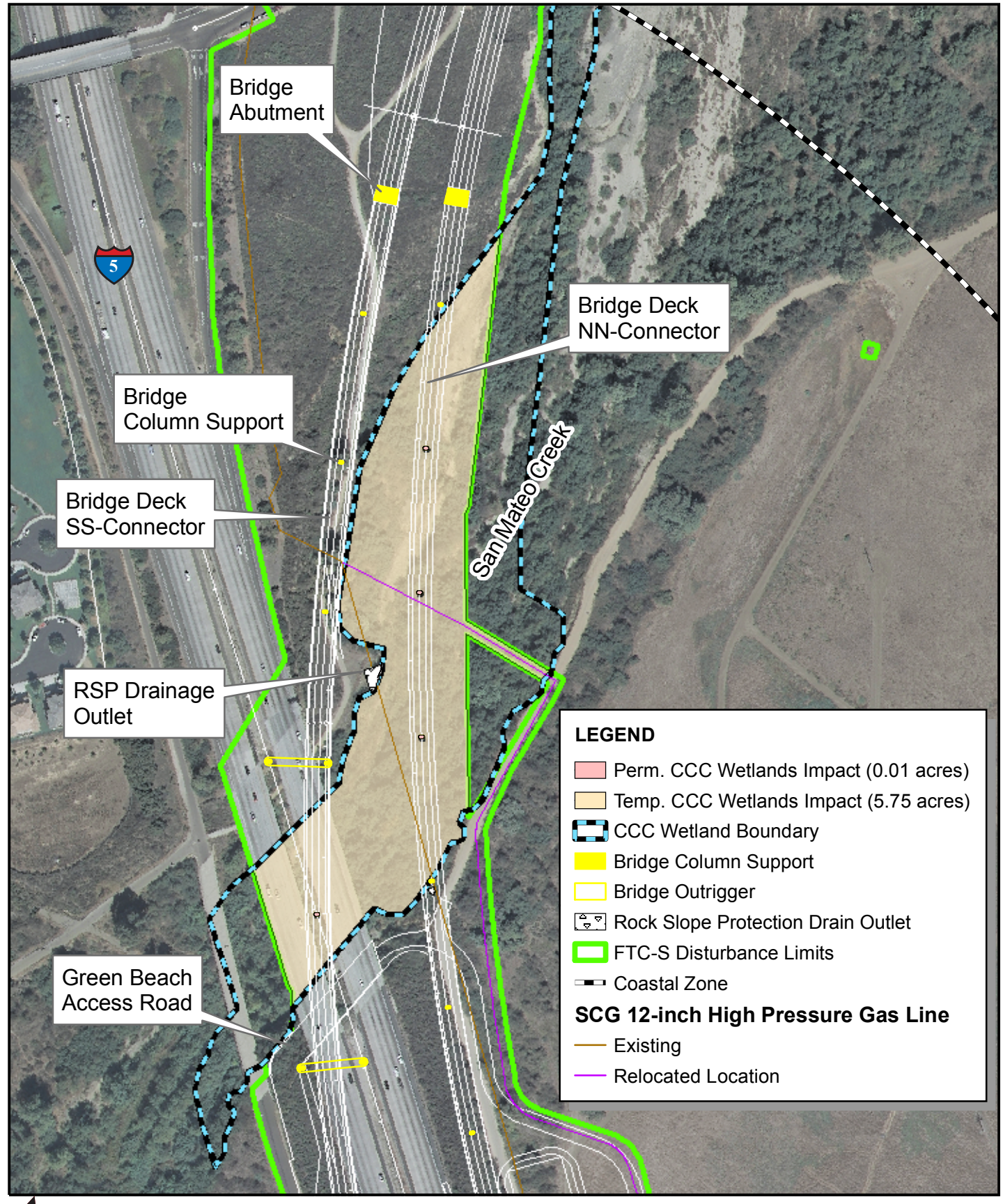
ATTACHMENT 4
PROPOSED CONSTRUCTION AT SAN MATEO CREEK



Proposed Construction at San Mateo Creek
Vegetation Map

Coastal Staff Wetlands Letter Response | Attachment 4

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_7_SAN_MATEO_CREEK_VEG_082607.MXD

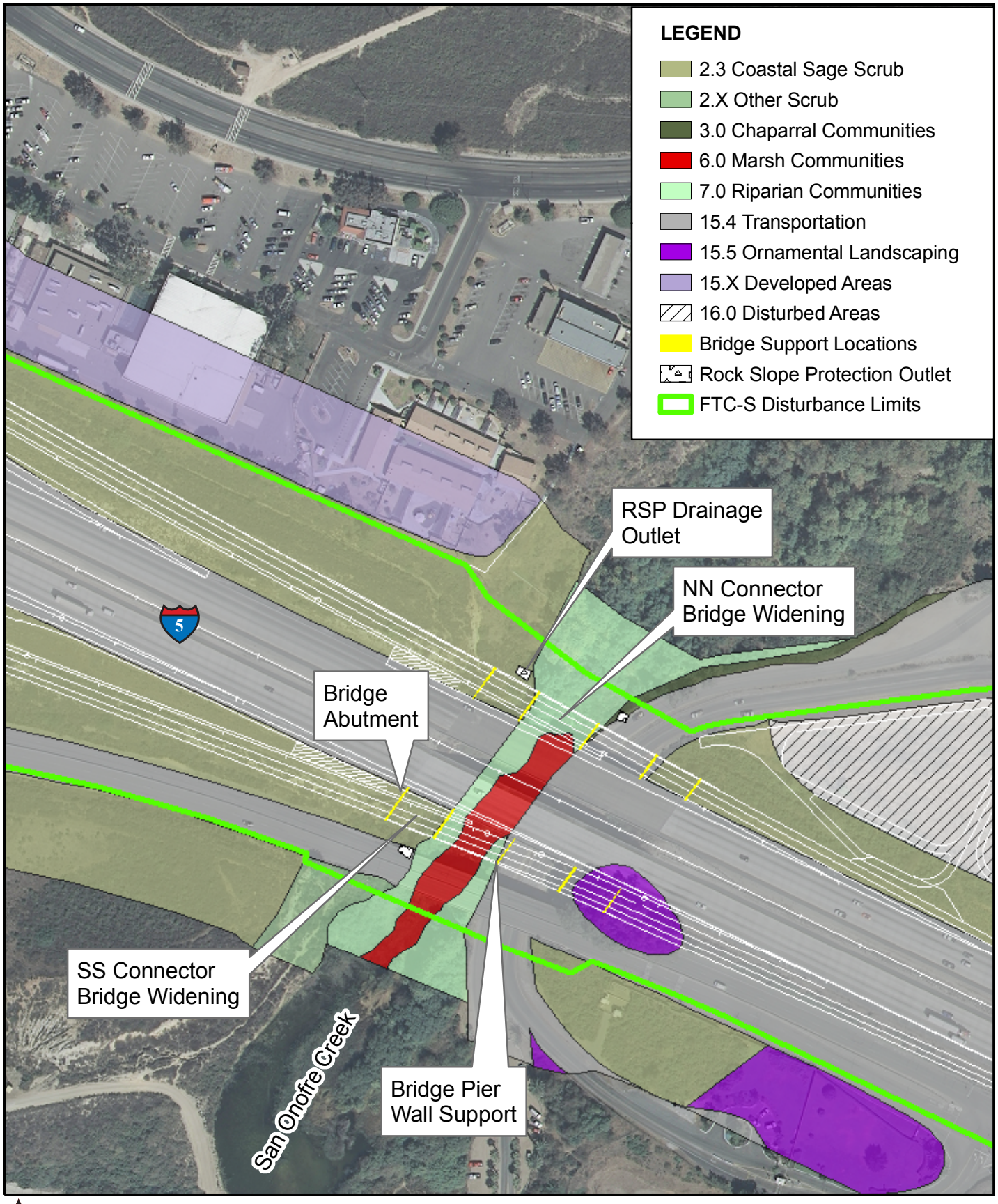


Proposed Construction at San Mateo Creek
Wetlands Impact Map

Coastal Staff Wetlands Letter Response | Attachment 4

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_7_SAN_MATEO_CREEK_WET_082607.MXD

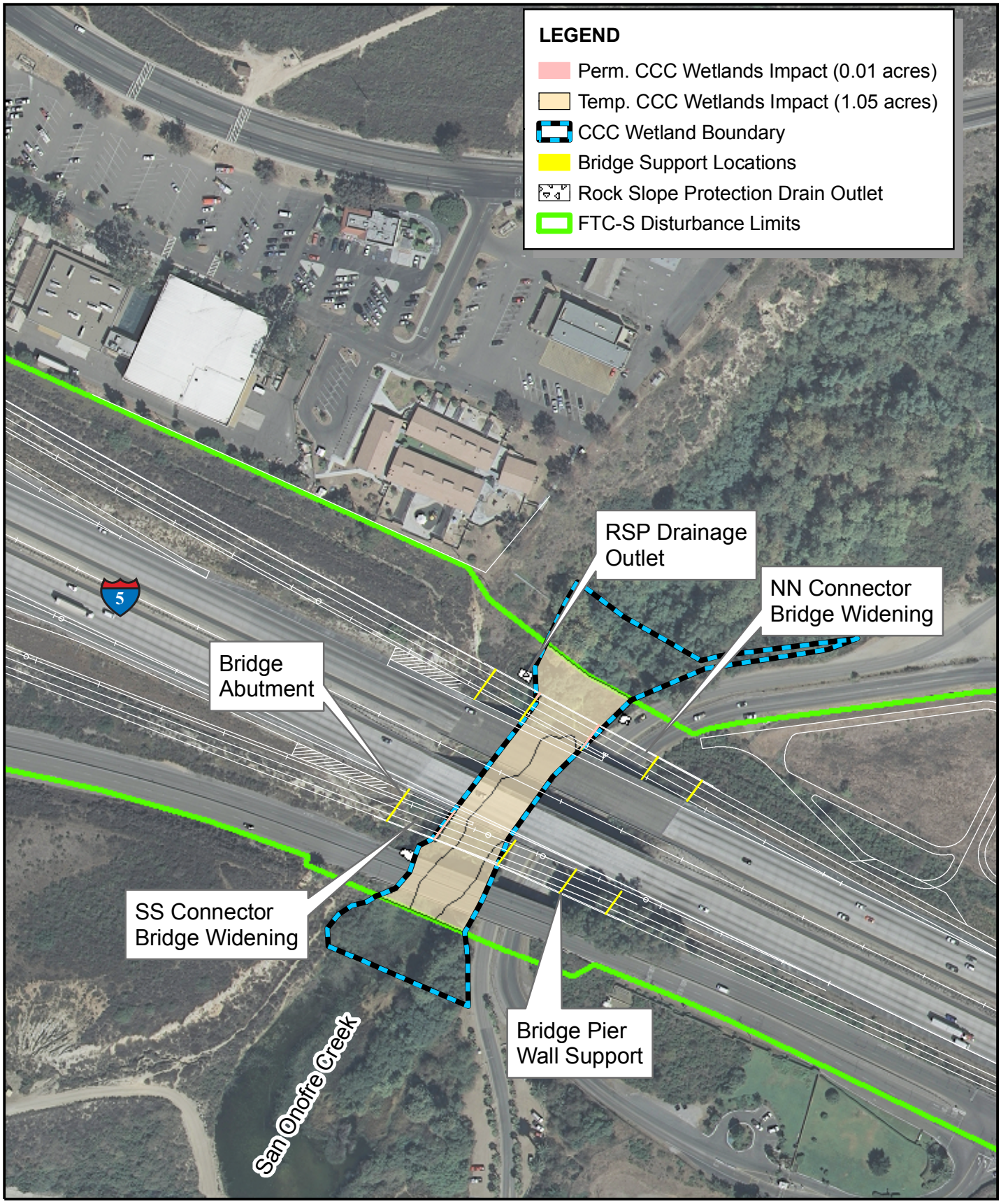
ATTACHMENT 5
PROPOSED CONSTRUCTION AT SAN ONOFRE CREEK



Proposed Construction at San Onofre Creek
Vegetation Map

Coastal Staff Wetlands Letter Response	Attachment 5

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_8_SAN_ONOFRE_CREEK_VEG_082707.MXD

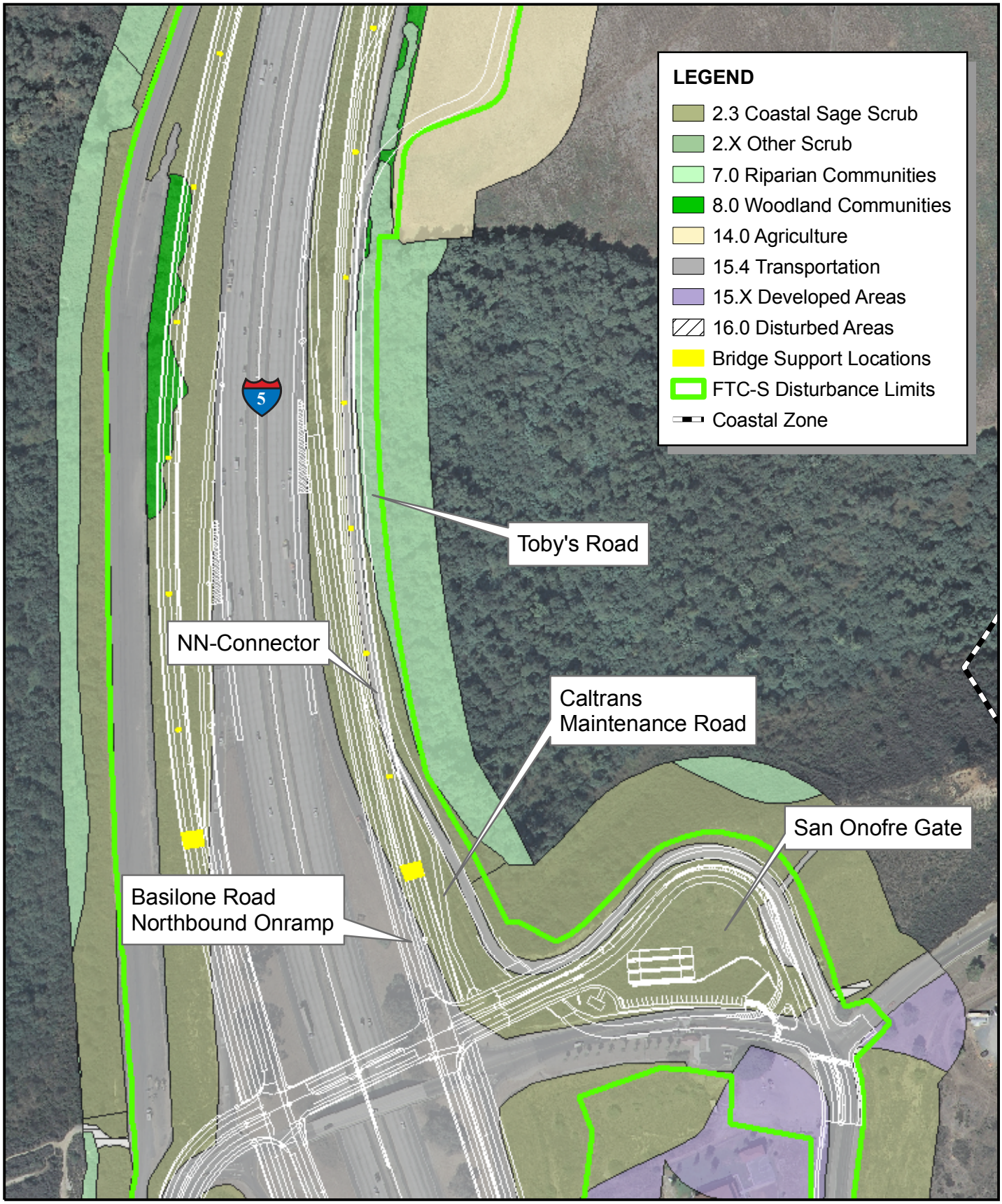


Proposed Construction at San Onofre Creek
Wetlands Impacts Map

Coastal Staff Wetlands Letter Response	Attachment 5

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_8_SAN_ONOFRE_CREEK_WET_082707.MXD

ATTACHMENT 6
PROPOSED CONSTRUCTION AT SAN ONOFRE GATE

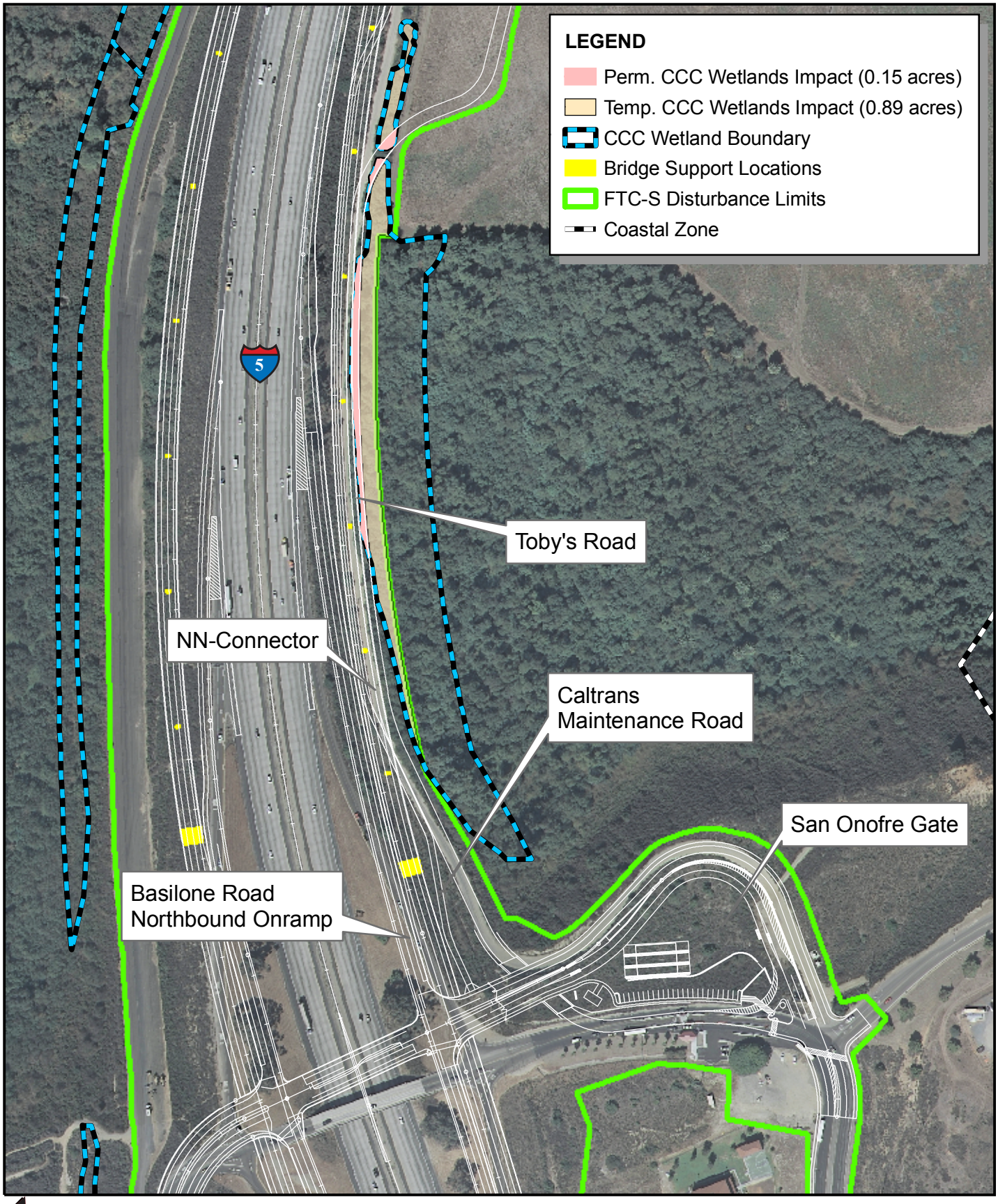


0 240 480 Feet

Proposed Construction at San Onofre Gate
Vegetation Map

Coastal Staff Wetlands Letter Response	Attachment 6

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_9_SAN_ONOFRE_GATE_VEG_082707.MXD



Proposed Construction at San Onofre Gate
Wetlands Impact Map

Coastal Staff Wetlands Letter Response	Attachment 6

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_9_SAN_ONOFRE_GATE_WET_081007.MXD

ATTACHMENT 7
SHADING STUDY

BonTerra
CONSULTING
An Environmental Planning/Resource Management Corporation

August 7, 2007

Ms. Maria Levario
Acting Director, Environmental and Planning
Transportation Corridor Agencies
125 Pacifica
Irvine, CA 92618

VIA EMAIL AND MAIL
levario@sjhtca.com

Subject: Vegetation Shading Analysis for the Proposed San Mateo, San Onofre, and San Juan Creek Bridge Structures for the Foothill Transportation Corridor-South Project

Dear Ms. Levario:

This analysis of the potential shading impacts from the preferred alternative is based on the engineering plans of the proposed bridge structures over San Mateo, San Onofre, and San Juan creeks, and previous analysis of shading impacts at two of the bridge locations. Coincidentally, the existing bridges at San Mateo and San Onofre Creeks were evaluated in the "Revised Shading Study Associated with Two Proposed Bridges, Spanning Existing Wetlands on the Marblehead Coastal Site, San Clemente, California", prepared by Glenn Lukos Associates (GLA December 4, 2001). The findings in the GLA document were utilized in support of the California Coastal Commission Coastal Development Permit for the Marblehead Coastal project currently under construction. The following table outlines the existing bridge conditions and the proposed bridge expansions.

The GLA report concluded, based on transect data collected along the southern edge of the creek directly beneath the north-bound bridge and immediately upstream, that the vegetation beneath of the San Mateo Bridge exhibited similar canopy cover compared to those areas outside the shaded areas of the San Mateo Bridge. Resources adjacent, and under, the existing San Onofre Bridge include southern riparian scrub and associated hydrophytic vegetation. In summary, there was no distinguishable difference between areas that were shaded by the bridge structure, or not shaded by the bridge structure. The GLA report did not analyze San Juan Creek; however, findings from the other bridges have been applied to potential impacts at San Juan Creek.

151 Kalmus Drive
Suite E-200
Costa Mesa
California 92626
(714) 444-9199
(714) 444-9599 fax
www.bonterraconsulting.com

EXISTING BRIDGE CONDITIONS AND THE PROPOSED BRIDGE EXPANSIONS

Creek Crossing	Existing Bridge Length (approx.)	Existing Bridge Width (approx.)	Existing Bridge Height Above Grade (approx.)	Proposed Bridge Length Over USACE Ordinary High Water Mark (approx.)	Proposed Bridge Width (approx.)	Proposed Bridge Height Above Grade (approx.)
San Mateo	500 feet	165 feet (including 30 feet gap between the two separate bridge spans)	55 feet	Southbound Connector – 300 feet, (615 will occur above the existing I-5/San Mateo Creek bridge) Northbound Connector – 920 feet, none of which occurs over the existing I-5/ San Mateo Creek bridge	Southbound Connector – 42 feet wide Northbound Connector – 42 feet	Southbound Connector 82 feet above existing grade, and 28 feet above the I-5 Northbound Connector 43 feet above grade
San Onofre	354 feet	165 feet (including 30 feet gap between the two separate bridge spans)	30 feet	90 feet on both the northbound and southbound lanes	40 feet on both the northbound and southbound lanes	30 feet
San Juan	N/A[1]	N/A	N/A	2,100 feet	91 feet	Maximum/Minimum Height above existing ground = 49.3/41.6 feet

The proposed northbound connector will span San Mateo Creek. At the crossing location, the creek vegetation consists of southern riparian scrub and associated understory vegetation, similar to the vegetation at the existing I-5/San Mateo Creek Bridge. Based on the similarity of the height of the existing I-5/San Mateo Creek Bridge and the proposed northbound connector, it is expected that the construction of the proposed project would not have a measurable impact on the existing riparian vegetation under the proposed northbound connector.

Approximately 960 feet of the southbound connector will similarly not have a measurable impact on the vegetation underneath the connecter based on the comparison of the existing vegetation of the I-5/San Mateo Creek Bridge and those resources that will be bridged by the southbound connector. However, a small segment of the southbound connector will be constructed over the existing bridge structure at the I-5/San Mateo Creek, which would increase the shading in the San Mateo Creek beyond the current conditions. This area of 0.38 acre (42 feet wide, 400 long) would contribute to additional shading within the San Mateo Creek area. However, this is not a substantial increase and therefore, no significant changes to the vegetation community under the southbound connector are expected.

The proposed expansion of the bridge at San Onofre Creek will be similar to the existing I-5/San Onofre Creek Bridge. Based on the similarity of the height of the existing I-5/San Onofre Creek Bridge and the proposed expansion, the construction of the proposed project would not have a measurable impact on the existing riparian vegetation under the proposed San Onofre Creek Bridge.

[1] N/A = not applicable. Bridge does not currently exist.

No bridge currently exists across San Juan Creek in the vicinity of the preferred alternative. The proposed bridge will be approximately 2,100 feet long, and 91 feet wide, and over 49 feet above natural grade at its maximum height. Since the height of the proposed bridge is similar to the existing 1-5 bridge height at San Mateo Creek, there would not be a substantial amount of shading and the minimal amount of shading would not significantly alter the vegetative resources under the bridge.

If you have any comments or questions, please contact me at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

R:\Projects\TCA\J004\Shading Anaysis-080707.doc

ATTACHMENT 8
COMPARISON OF BRIDGE STRUCTURE TYPES

MEMORANDUM

FROM: Transportation Corridor Agencies

TO: California Coastal Commission

SUBJECT: Comparison of Bridge Structure Types
Foothill Transportation Corridor – South

DATE: August 30, 2007

This memorandum provides the Transportation Corridor Agencies' (TCA) response to comment 22 dated July 9, 2007. The comment requests that TCA provide a clarification of the information in a report that was provided to the Commission titled, "An Evaluation of Alternative Designs for FTC-S Connectors to I-5," dated April 2006. Specifically, the comment says that, "it is impossible to determine the costs of the various alternatives, the feasibility, or the environmental effects of any of the alternatives included." The comment also asks for, "information necessary to make comparisons such as cost, technical feasibility, extent of visual, habitat, or other effects, amount and location of grading needed where grading is cited as a relevant feasibility factor, and any relevant Marine Corps requirements that may bear on feasibility."

Introduction

The project proposes constructing the I-5/SR-241 connectors as Cast-In-Place Prestressed Concrete Box structures. This construction method is common in California and has several advantages as will be discussed in this paper. However, it also has limitations that may result in environmental impacts, which will also be discussed further in this paper.

The attached matrix extracts information from the referenced report and reorganizes it to be more concise, address the comment, and inform the reader of the evaluation process that led to the selection of Cast-In-Place Prestressed Concrete Box structures as the proposed structure type. Additional qualitative assessments have been included in the matrix to clarify the comparison of structure types.

Before discussing the structure types that were evaluated in the report, it is important to note that the design currently being studied by TCA has undergone nearly 20 years of refinement. All practical efforts have been made to avoid impacts to the San Mateo Creek and where it was not practical to avoid the creek, impacts have been minimized to the greatest practical extent. The NN Connector (on the inland side of Interstate 5) was lengthened to cross over the creek and the agricultural fields (part of the floodplain) rather than constructing it on fill within the creek and floodplain. Span lengths have been

increased to the practical maximum for the proposed structure type to reduce the number of columns within the creek and floodplain. Column size has been minimized while adhering to structural and seismic design standards to reduce the area of impact within the creek and floodplain. Temporary impacts related to construction have been considered, as have impacts to the Marine Corps mission on Camp Pendleton, and Caltrans design standards.

Structure-Type Comparison

Eight basic structure types were evaluated. Brief descriptions and photographs of each structure type are included in Attachment 1. Computer renderings of four of the eight structure types are also included in Attachment 2.

- Cast-in-Place Prestressed Concrete Box (the proposed structure type)
- Cable Stayed with Prestressed Concrete Box
- Suspension Bridge with Steel Orthotropic Box
- Inclined Ribs Through Tied Arch
- Concrete Segmental
- Extradosed
- Steel Plate/Steel Box Girder
- Truss

Each structure type was evaluated based on two basic categories of criteria:

- Environmental Effect
- Feasibility

Environmental effect was qualitatively evaluated via five points:

- Visual Impact
- Permanent Wetland Impact – Lowland Grading
- Temporary Wetland Impact – Lowland Grading
- Upland Grading
- Campground Impacts

Feasibility was qualitatively evaluated via eight points:

- Span Length
- Alignment
- Constructability
- Maintenance
- Cost Effectiveness / Economy
- Vertical Height / Marine Corps Air Space Impacts
- Marine Corps Operations
- Caltrans Approvability

Environmental Effect

Visual impact was assessed based on the change in the visual character of the area with the implementation of the various structure types. The most significant contributors to visual impact were towers and cables. Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders are flat with no construction above the superstructure and thus result in the lowest level of visual impact. The other structure types all include various configurations of towers and cables or other elements above the finished surface of the roadway which contribute to their higher visual impact.

Permanent wetland impacts are related to the area within the creek and floodplain that would be permanently impacted by the columns, abutments, and other permanent supports for the structures. The structure types with shorter spans (Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders) result in greater permanent impacts than the structures with longer finished spans.

Temporary wetland impacts are related to construction techniques. Construction of falsework in the creek during construction is a temporary impact. Construction of coffer dams and dewatering to construct tower foundations are also temporary impacts. Cast-in-Steel-Shell foundations (likely for Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders) do not require cofferdams or dewatering.

Upland grading is related to the approach roadways, the abutments and other appurtenances (e.g., anchorages for the suspension bridge) that would be above the floodplain. The alignment is assumed to be the same for all structure types, but the need to balance the length of the approach spans in comparison to the main span affects the amount of grading, with the long main span bridge types resulting in more upland grading. The anchorages for the suspension bridge are large structures that would require considerable upland grading. Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girder structure types would minimize upland grading impacts because they are more flexible with respect to span lengths.

Campground impacts are two-fold:

- Acquisition of campground property, and
- Visual impact specifically from the campground

The alternatives with towers and that require modification of the alignment (straightening the alignment is required for some structure types) resulted in higher campground impacts (Suspension bridge, Inclined Ribs Through Tied Arch, Extradosed, and Truss). Those structure types that maintained the proposed alignment and had no towers, cables, and potentially lights on top of the towers were found to have lower campground impacts (Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders).

From the standpoint of the Environmental Effects, the **Cast-in-Place Prestressed Concrete Box Girder, the Concrete Segmental, and the Steel Plate/Steel Box Girder bridge types all performed about equally well with respect to three of the five criteria** (Visual Impact, Upland Grading, and Campground Impacts). Because they all have maximum spans that are less than 1000 feet, they all result in one or more columns in the creek (as opposed to spanning the creek and floodplain as all of the other structure types could do – see "Feasibility – Span Length" on the next page) and have associated Temporary Wetland Impacts – Lowland Grading. The Concrete Segmental and the Steel Plate/Steel Box Girder bridge types may have more or fewer columns in the creek depending on several factors that are not defined at this time.

Feasibility

Span length is dependent on structure type – some structure types have a maximum span length less than the width of the creek and floodplain. Other structure types are not economical for spans less than a certain minimum length (suspension bridges are best suited to spans greater than 1,500 feet). Those with shorter maximum spans will require column bents within the creek and/or floodplain (Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders).

The proposed alignments of the connectors are curved. Some of the structure types require a straight alignment to be constructible. A straight alignment would move the connectors more inland into Camp Pendleton and/or result in residential acquisitions in San Clemente. The structure types that can be built on a curved alignment include Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders.

Constructability relates to the construction method and the requirements of that method. Construction methods that include precast (concrete or steel) elements reduce the amount of falsework on site, but require modes of transportation of very large and very heavy precast elements. For large signature spans over bodies of water, these precast elements are often floated or barged to the construction site – this is not an option at this location. In other cases the elements are trucked to the site. This method of transportation constrains the size of the precast element to what can be transported on the highway system – both the weight of the element and the vertical height of the element on a truck need to be considered when evaluating whether precast elements can be trucked to the construction site. Another option would be to cast elements onsite, but this method requires a large fabrication yard. Also, the extradosed structure type requires large diameter columns. It is likely that a column would need to be located between the existing I-5 bridges over San Mateo Creek. The available clearance between those two existing structures may make this structure type unconstructable. The Cast-in-Place Prestressed Concrete Box Girder structure type is the most easily constructed because you can transport relatively small elements in smaller amounts to the site, assemble them on site and not have construction activities occurring within the creek other than setup

and removal of falsework. This is also the structure type that contractors in California are most familiar with and can thus give the most competitive pricing.

Maintenance is an ongoing concern for any highway facility. Structure types with cables and other exposed steel elements require painting and rust/corrosion prevention measures. Segmental construction greatly increases the number of joints that need to be maintained. The Cast-in-Place Prestressed Concrete Box Girder structure type requires the least maintenance – one of the factors contributing to this structure type being so prevalent in California.

Cost effectiveness and economy are based on both the quantity of materials and the construction method used. The structure types that are longer, or include towers and cables, or require elaborate traveling formwork, or require considerably more steel than other structure types are likely to cost more and be less cost effective. Again, the Cast-in-Place Prestressed Concrete Box Girder is the most economical for this span length.

Vertical height /air space impacts relate to Marine Corps equipment testing and usage. Towers and cables would affect how this section of the base air space can be used. The Corps performs helicopter night training which would be negatively affected by the existence of towers and cables above the connectors. Similar to the visual impact assessment, Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders result in the least impact to air space because they are flat with no construction above the superstructure and thus result in the lowest level of air space impact. The other structure types all include various configurations of towers and cables or other elements above the finished surface of the roadway which contribute to their height and air space impact.

Air space impacts are separate from (but related to) the Marine Corps operations impact assessment, which is primarily a land based issue. The currently proposed alignment has received a lot of input from the Marine Corps regarding minimization of impact to the Corps mission at Camp Pendleton. The input from the Corps has essentially resulted in the alignment being pushed as close to the perimeter of the base as possible to minimize the impact on base operations and bisect the base as little as possible. Realignment of the connectors inland (to accommodate a straighter alignment) would increase the impact on the Corps mission and would not be acceptable to the Corps. The structure types that result in the least impact to the Corps mission include Cast-in-Place Prestressed Concrete Box Girder, Concrete Segmental, and Steel Plate/Steel Box Girders.

Caltrans approval will be needed since the connectors will become part of the state highway system. The Cast-in-Place Prestressed Concrete Box Girder structure type is the most commonly used structure type in the state. For some of the evaluated structure types (cable stayed and inclined ribs through tied arch), there are no major examples in the state. Others (suspension) are atypical of this size of crossing. Caltrans generally builds concrete structures (Cast-in-Place Prestressed Concrete Box Girder) for seismic and maintenance reasons. Caltrans does not typically build steel roadway structures (steel plate/steel box girder or truss) due in large part to seismic concerns. Railroad

structures are typically steel, and while there are recent examples of steel roadway structures, they are few and far between.

The feasibility issues indicate that the **Cast-in-Place Prestressed Concrete Box Girder structure type performed the best with respect to seven of the eight criteria**. Only the fact that it is limited to relatively short span lengths made it a less desirable structure type when compared with some of the other structure types.

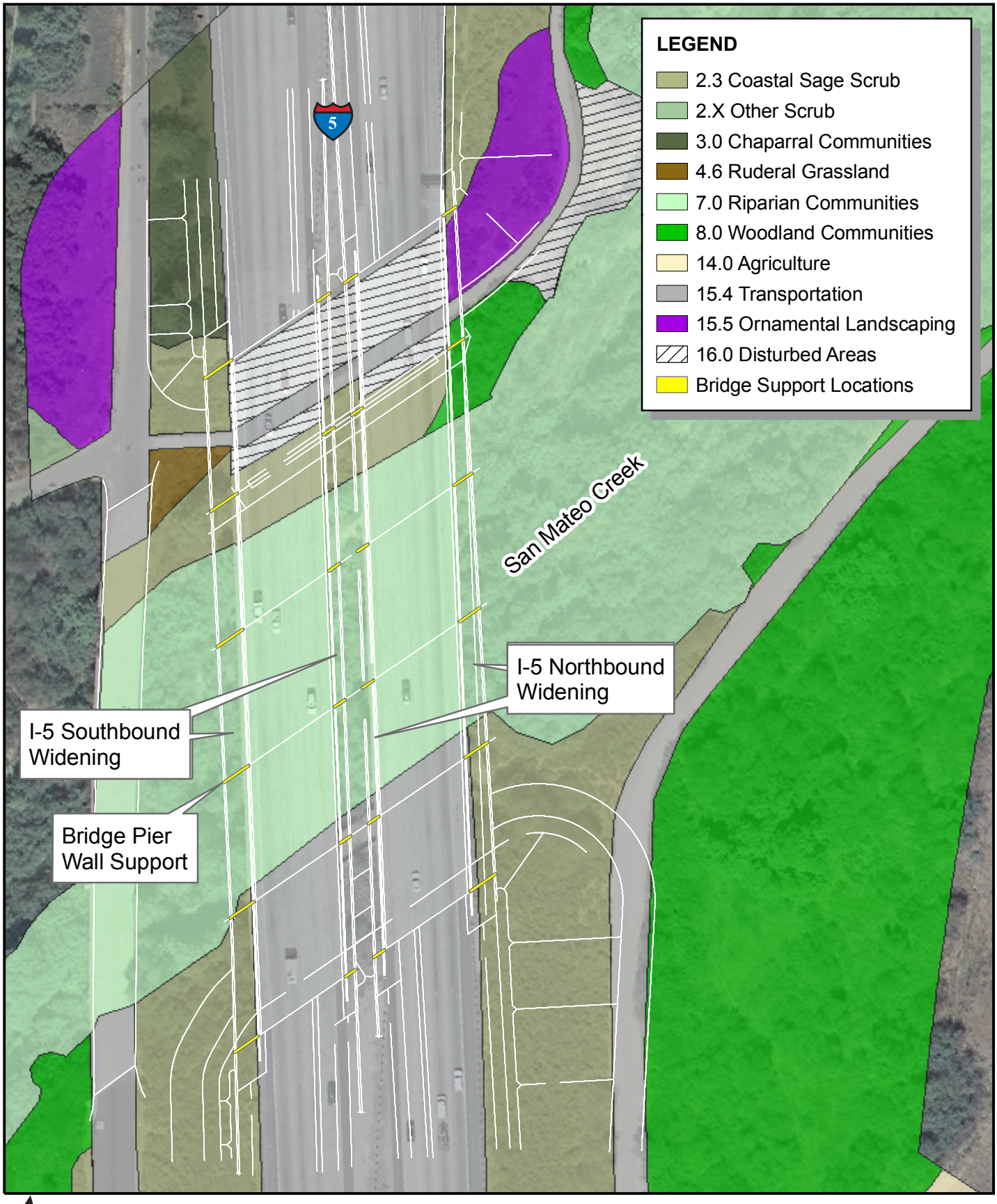
Conclusion

Based on both the Environmental Effect and the Feasibility criteria, the **Cast-in-Place Prestressed Concrete Box Girder structure type performed best with respect to 10 of the 13 criteria (77%) and is the preferred structure type** for the two connectors at the I-5/SR-241 interchange. The next best performing structure type is the Concrete Segmental with respect to 7 of the 13 criteria (54%), for all of which the Cast-in-Place Prestressed Concrete Box Girder performed at least as well.

Comparison of Structure Types

	A. Cast-in-Place / Prestressed ***(Proposed)***	*B. Cable Stayed with Prestressed Concrete Box*	*C. Suspension Bridge with Steel Orthotropic Box*	*D. Inclined Ribs Through Tied-Arch*	*E. Concrete Segmental*	*F. Extradosed*	*G. Steel Plate/Steel Box Girder*	*H. Truss*
Environmental Effect								
Visual Impact	**Low**	High – towers and cables	High – towers and cables	High	**Low**	High – towers and cables	**Low**	High
Permanent Wetland Impact – Lowland Grading	Moderate – four columns in creek	**Low – span creek**	**Low – span creek**	**Low – span creek**	Moderate to High– one to six columns in creek	**Low – span creek**	Moderate – one, two or three columns in creek	**Low – span creek**
Temporary Wetland Impact – Lowland Grading	Temporary falsework and formwork construction within creek	Potentially no need for falsework in creek; construction of towers may require cofferdam and dewatering	Potentially no need for falsework in creek; construction of towers may require cofferdam and dewatering	Potentially no need for falsework in creek; construction of towers may require cofferdam and dewatering	Temporary formwork construction within creek	Potentially no need for falsework in creek; construction of towers may require cofferdam and dewatering	Temporary formwork construction within creek	Potentially no need for falsework in creek; construction of towers may require cofferdam and dewatering
Upland Grading	**Low/minimizes upland grading**	Moderate at northeast abutment to provide appropriate approach span ratio.	Moderate to high to accommodate anchors at both ends.	Moderate at northeast abutment to provide appropriate approach span ratio.	**Low/minimal**	Moderate at northeast abutment to provide appropriate approach span ratio.	**Low/minimal**	Moderate at northeast abutment to provide appropriate approach span ratio.
Campground Impacts	**Low; alignment minimizes encroachment; bridge type minimizes visual impact**	Moderate; alignment minimizes encroachment; bridge type results in high visual impact	High; alignment change increases encroachment; bridge type results in high visual impact	High; alignment change increases encroachment; bridge type results in high visual impact	**Low; alignment minimizes encroachment; bridge type minimizes visual impact**	High; alignment change increases encroachment; bridge type results in high visual impact	**Low; alignment minimizes encroachment; bridge type minimizes visual impact**	High; alignment change increases encroachment; bridge type results in high visual impact
Feasibility								
Span Length	Maximum approximately 360 feet, requires four columns within creek	**Can be 1000 feet, no columns in creek. Best suited to long spans greater than 600 feet.**	**Can be 1000 feet, no columns in creek. Best suited to long spans greater than 1,500 feet.**	**Can be 1000 feet, no columns in creek. Best suited to long spans greater than 500 feet.**	Maximum approximately 750 feet, requires at least 1 column (maybe more) within creek	Best suited to spans between 300 and 900 feet.	Maximum approximately 600 feet, requires at least 1 column (maybe more) within creek	**Can be 1000 feet, no columns in creek. Best suited to long spans greater than 500 feet.**
Alignment	**Can be curved (as currently designed)**	Extremely unusual to have a curved alignment	Must be straight, requires redesign	Must be straight, requires redesign	**Can be curved (as currently designed)**	Must be straight, requires redesign	**Can be curved (as currently designed)**	Must be straight, requires redesign
Constructability	**Conventional construction practices; materials trucked to site**	Lacks site accessibility for large prefabricated elements	Lacks site accessibility for large prefabricated elements	Lacks site accessibility for large prefabricated elements	May not be able to truck large elements to the site; not able to float elements to site via creek; may require casting yard	Especially large columns required – may not be able to construct one in the median of I-5 for WS connector	Lacks site accessibility for large prefabricated elements	Lacks site accessibility for large prefabricated elements
Maintenance	**Moderate, conventional**	High – cable maintenance	High – cable maintenance	High	High – joint maintenance	High – cable maintenance	High – painting	High
Cost Effectiveness / Economy	**Cost effective for length and height of connectors**	Not cost effective for length of span	Not cost effective for length of span	Not cost effective for length of span	Not cost effective for length of span	Not cost effective for length of span	Less cost effective for length of span	Not cost effective for length of span
Vertical Height / Air Space Impact	**No Impact – no construction above bridge deck**	Probable Impact – towers 50-90 feet above bridge deck	Probable Impact – towers 50-120 feet above bridge deck	Probable Impact	**No Impact – no construction above bridge deck**	Probable Impact – towers 45 feet above bridge deck	**No Impact – no construction above bridge deck**	Probable Impact
Marine Corps Operations	**Alignment stays close to existing I-5 and Cristianitos Road**	Straight alignment pushes into base more and/or impacts San Clemente	Straight alignment pushes into base more and/or impacts San Clemente	Straight alignment pushes into base more and/or impacts San Clemente	**Alignment stays close to existing I-5 and Cristianitos Road**	Straight alignment pushes into base more and/or impacts San Clemente	**Alignment stays close to existing I-5 and Cristianitos Road**	Straight alignment pushes into base more and/or impacts San Clemente
Caltrans Approvability	**Very conventional in California, easily approved by Caltrans**	Unconventional; only cable stayed bridge in California is a pedestrian bridge (2006).	Unconventional; typically for longer signature spans	Unconventional; no major structures of this type in the state (2006)	Unconventional; typically used over body of water with segments floated or trucked to site	Unconventional	Use of steel roadway structures is atypical in California	Unconventional
Material	**Concrete**	**Concrete**	Concrete/Steel	Concrete/Steel	**Concrete**	**Concrete**	Steel	Steel

ATTACHMENT 9
I-5 WIDENING ALTERNATIVE AT SAN MATEO CREEK



I-5 Widening Alternative at San Mateo Creek
Vegetation Map

Coastal Staff Wetlands Letter Response | Attachment 9

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_24_I5W_SAN_MATEO_CREEK_VEG_081107.MXD

I-5 Widening Alternative at San Mateo Creek
Wetlands Impact Map

Coastal Staff Wetlands Letter Response	Attachment 9

M:\ENGINEERING\ARCGIS\COASTAL ZONE\CONSISTENCY RESPONSE\MXD\RTC_24_I5W_SAN_MATEO_CREEK_WET_081107.MXD

ATTACHMENT 10

TABLE 13 OF THE DRAFT UPPER CHIQUITA CANYON CONSERVATION AREA COMPREHENSIVE HABITAT RESTORATION PLAN

Table 13
Summary of Restoration Time Table

Restoration Tasks	Year 1 Year 2				Year 3 Year4				Year 4 Year 5				Year 6 Year 7				Year 8 Year9				Year 10 Year 11				Year 12 Year 13			
	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S
Seed Collection	X X	X X	X X	X X	X X	X X	X X	X X	*	*	*	*																
Site Preparation Weeding	X X	X X	X X	X X	X X	X X	X X	X X	*	*	*	*																
Plant Container Plants	X				X																							
Container Plant Irrigation	X	X	X	X	X X	X X	X X	X X	X X	X X	X X	X X	*	*	*	*												
Seed	X	X			X X	X X			X	X																		
Maintenance Weeding	X	X	X	X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X *	X *	X *	X *	*	*	*	*				
Remedial Planting/Seeding					* *				* *				* *				*											
Horticultural Monitoring	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X				
Performance Monitoring				X			X X				X X				X X				X X				X X			X X	

* - If necessary